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ON

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The First Goulstonian Lecture in 1928 delivered before the Royal College of Physicians of London on March 13th

BY T. IZOD BENNETT, M.D. LOND.,

FELLOW OF THE COLLEGE; PHYSICIAN TO OUT-PATIENTS, MIDDLESEX HOSPITAL, AND TO THE ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.

LECTURE I.—THE PROBLEM OF URÆMIA.

THE more one studies nephritis, the more is one aware of the extreme complexity of the subject, and any attempt to review the problems of uræmia must be tentative, although I feel that recent work has thrown new light on the mechanism governing some of the phenomena which we group together under this heading. A great variety of symptoms is by different writers included under the heading of uræmia, and at the outset I feel we must make distinction between those which occur where both ureters become simultaneously blocked, or when a single functional kidney is accidentally removed, and the train of symptoms which characterises the termination of a case of nephritis. The former syndrome is usually marked merely by slowly deepening coma, whilst in the latter are seen, in classical form, not only the gastro-intestinal symptoms, but also the muscular twitchings, the convulsions, and often the hyperpnœa, which form for most of us the picture of true uræmia.

I propose to describe some typical biochemical observations from a case of this latter type, and after endeavouring to demonstrate those aspects which I feel to be of true importance in the production of the peculiar nervous phenomena of uræmia, I shall describe some recent experimental work which appears to be of importance in this connexion.

A CASE OF RENAL FAILURE.

The original custom for the Goulstonian lecturer to give a demonstration on some dead body, "to be then and there dissected for the disease treated in the lectures," has for many years fallen into disuse. But I may perhaps be permitted to begin my lecture by describing a case which illustrates in many details the problems before us.

The patient, a woman then aged 42, came under my care in 1923 complaining of abdominal discomfort associated with a tumour in the right side which was rapidly increasing in size. Albumin was present in small quantities in the urine, and the blood showed marked retention of nitrogen. It was decided after consultation that an exploratory operation should be performed. This was carried out by my colleague, Mr. John Murray, and revealed extensive cystic disease of both kidneys, although the left was so much less enlarged than the right that it had not been palpable before operation. The incision was closed and nothing further was done, recovery from the operation being quite straightforward.

Course of the Disease.

At her earnest request a clear explanation of the condition and its probable consequences was made to the patient, who was a person remarkable both for her intelligence and philosophy. For two years already she had complained of constant dryness of the mouth with a peculiar taste, as well as of some diminution in her bodily strength. She was advised to abstain as much as possible from foods containing a large proportion of protein, and returned to her home. Two years later she consulted me again and was placed on a diet containing a very high proportion of carbohydrates. At this time the right kidney had increased considerably in size and the left had become readily palpable. There was considerable loss of strength, so that she was obliged to lead the life of a semi-invalid, rising for not more than six hours daily and seldom walking as much as one mile on any day. She returned home, where she lived chiefly upon green vegetables, biscuits, and farinaceous food, and gradually declined in vigour until the middle of last summer, when she again came into hospital for closer observation. I feel it my duty to record the fact that this lady was so desirous to be in any way of service to others who might be ill, that for four years she placed herself at my disposal for any investigations which I might feel to be of possible utility.

At the time of her final admission to hospital in the summer of last year, her appearance was, on the whole, healthy, although there was a slight puffiness below the eyes, and the legs, although not pitting on pressure, had a somewhat swollen appearance. She was rather deeply freckled and pigmented, which made her aspect deceptively healthy, for she was so weak that it was impossible for her to walk more than 100 yards, and dyspepsia with occasional vomiting, together with attacks of breathlessness during the night, were making her life uncomfortable. Although she could give an astonishingly clear account of her symptoms, she stated that her brain felt as if it were in a fog, and that consecutive thinking was difficult for her. She gave a graphic account of the constantly bitter taste of her saliva, and complained of a frequent sinking feeling and faintness between meals. On examination there was no obvious hypertrophy of the heart, though the blood pressure was 100 diastolic and 180 systolic. The renal tumours were very large, distending both flanks; the right remained larger than the left. Polyuria was present, but disturbed her very little, and her sight was entirely unimpaired, there being no changes whatever in the fundus oculi.

Treatment and its Effects.

My first endeavour was to alleviate her nausea and tendency to vomit, and this was accomplished by still further curtailing her diet, so that she lived for several weeks on nothing but tea without milk, orange juice, and dry biscuits, the total value of the diet being something less than 600 calories a day. On this her gastro-intestinal symptoms were indubitably less acute, but she was hungry and felt her weakness to be increased, and I was accordingly obliged to revert to the somewhat more generous diet she had previously taken. Her condition as regards nitrogenous bodies in the blood up to this time is shown in Table I.

TABLE I.

—	Dec., 1923.	March, 1925.	Oct., 1926.	June, 1927.	Sept., 1927.	Oct., 1927.
Blood-urea ..	50·6	64	68	105	90	146
Non-protein N. ..	41·9	84	52	75	96	108
Creatinine ..	1·8	2·1	2·5	3·4	4·6	6·1
Uric acid	2·9	3·6	4·8	—	3·8	2·6

(In this and subsequent tables, unless otherwise mentioned, figures represent milligrammes per 100 c.cm.)

These figures also show the upward trend of the commoner nitrogenous bodies up to the time of her final admission. The last three columns suggest that the very restricted diet had exerted some influence in reducing the concentration in the blood, but this possible improvement was abruptly lost, as shown by the high figures in the last column, when the more generous diet was resumed. Until the end of October the clinical condition was unchanged and arrangements were then made for the patient to return to her home.

The Final Phase.

In a recent essay dealing with the phenomena of uræmia, Sir John Rose Bradford has described the abrupt and dramatic violence which sometimes characterises the onset of the final uræmic symptoms. Such was my experience in the present case, for in the early morning of Nov. 2nd, 1927, the patient was seized with violent convulsions followed by unconsciousness. Within an hour she had apparently recovered and, though a little frightened, gave a clear account of her symptoms and described how the twitching of her muscles, which was now very apparent, had first been observed on the previous day, when some stiffness of the limbs and occasional aching in the back had troubled her. The blood pressure remained in the region of 150 mm. systolic, and a full half litre of urine was passed. This condition, of clear consciousness with sharp twitchings of the muscles, remained unchanged for a further 24 hours, and it is worthy of mention that her mental state was one of entire comprehension of her situation; she talked cheerfully and with full intelligence, and was at pains to call the sister of the ward and to give instructions that both my friend, Prof. E. C. Dodds, and myself were to be allowed to take any specimens of blood or cerebro-spinal fluid we might desire at any time, and that we were to have full liberty to carry out complete post-mortem examination if she should not survive.

During that night several severe fits occurred, between which the patient was only semi-conscious, and the muscular twitchings were very noticeable. She complained of extreme pain in the back, apparently due to the convulsive contraction of the erector spinæ muscle. Calcium lactate in doses

of grs. 5 and sodium bicarbonate in doses of grs. 60 were given hourly during the following day, and more than one pint of urine was passed during the same period.

Apparently as the result of this treatment, consciousness was regained, and during the next 24 hours twitching was less marked; the patient could reply to all questions, although her mental state was very confused. She drank fluids freely, and passed fair amounts of urine, although incontinence was present. Drowsiness reappeared on the night of Nov. 5th, and convulsions became frequent, with almost complete unconsciousness between the attacks. It was felt that there was no justification in proceeding to intravenous medication and, therefore, no further alkali was given during the day of Nov. 6th, when the patient lay in coma. One convulsion occurred at 6 P.M., and death followed an hour later.

The following table shows the nitrogenous constituents of the blood during this last phase.

TABLE II.

—	Nov. 2nd.	3rd.	4th.	5th.	6th.	7th (p.m.)
Blood-urea ..	257	321	356	292	367	357
Non-protein N. ..	215	241	260	220	277	272
Creatinine ..	7·5	6	6·5	6·5	7·4	9·2
Uric acid.. ..	8	7·2	7·3	9·6	14	9·6
Amino-acid N. ..	6·2	6·8	5·9	5·2	7·4	12·8

COMMENTARY.

The case which I have related is one which has been selected purposely as illustrating several important points. In the first place, it seems to me of value in that it is an example of pure and progressive renal failure terminating in uræmia, without being a case of true nephritis. Short of deliberate experiment, it is difficult to imagine circumstances by which the effects of slow destruction of kidney substance could be produced as accurately as is done by this strange disease.

It is not my purpose to enter into discussion of the pathology of cystic disease, for it is impossible yet to formulate even a plausible theory to account for this affection, but rather I would ask you to consider with me in detail the main symptoms which affected this patient, with a view to deciding to what degree we can explain the mechanism by which they were produced.

Until the last four days of her life she was really seriously troubled by two sets of symptoms only: first, those of progressive weakness; and secondly, nausea, anorexia, and especially a foul and sour taste in the mouth. It is plausible to suggest that the weakness was largely the result of the low diet on which she was obliged to live, whilst the disorders of appetite and taste were almost certainly the result of the over-saturation of the blood with urea and kindred nitrogenous substances. The account of the taste, given by the patient, was a very exact description of that of urea, and the following analysis of her saliva, compared with that of normal persons, as reported by Dodds, supports this belief very strongly.

TABLE III.—*Analysis of Nitrogenous Constituents of Saliva.*

	Ammonia (as N).	Urea.
Normal average	6·3	9
Uræmic patient	75	41

It is perhaps of particular interest that neither œdema nor hypertension was present in more than slight degree, but to these facts I shall revert later.

Returning to the events of the last five days of her life, we are faced with the classical phenomena of acute uræmia, with its two customary and interwoven symptoms—convulsions and coma. These symptoms are clearly referable to the central nervous system, and with them we must discuss the muscular twitchings which were a prominent feature of the terminal period, even at times when the brain was clear. The progressive coma typical of calculous anuria and of complete excision of the kidneys has long been distinguished from the twitchings and fits of certain other cases. Possibly the present case should be regarded as exhibiting both these types intermingled. But it is essentially the muscular twitchings and convulsions which place the present case in the category of true uræmia, and it is my desire to see to what extent these symptoms can be explained by observations on the changes in the body fluids which occur in such subjects.

NITROGEN RETENTION.

Perhaps the most popular explanation of uræmia is that it is the direct result of the accumulation of urea and kindred substances in the blood. Bright himself was to some extent the originator of this theory. In his Goulstonian lectures, delivered in 1833, he said: "What seems in some way to account for the general derangement and suffering of the constitution is the fact that urea becomes demonstrable in the circulating mass, and the blood becomes impregnated with that substance."

In the 95 years which have followed, this conception of the significance of urea retention has been amplified. We have learnt that urea is but one of the nitrogenous bodies which accumulates in the blood in nephritis, and we have learnt that a similar retention occurs in the case of certain non-nitrogenous substances. Towards the beginning of the present century the study of this aspect of nephritis was given a fresh impetus by the work of Widal and Javal, who introduced more accurate methods of blood analysis, and of Achard, whose recent summary of the subject is a model of clear exposition. This work appears to have focused the attention of many French observers to an extent that is perhaps excessive. For though we all realise to-day that the retention of nitrogenous substances in the blood is an invaluable help in the diagnosis of renal failure, and though we appreciate the fact that high nitrogen figures may become of great prognostic importance, we also realise that nitrogen retention by itself offers no explanation of the actual phenomena of uræmia. Without entering into the bulky literature of this subject, I venture to summarise the chief reasons against nitrogen retention being the cause of uræmia as follows.

1. The administration of urea and kindred substances to animals does not produce uræmia.
2. Conditions such as cystic disease of the kidney or prostatic obstruction often persist for years with marked nitrogen retention but no evidence of uræmia.
3. Cases of uræmia without nitrogen retention are occasionally observed.

RETENTION OF NON-NITROGENOUS SUBSTANCES.

The retention of nitrogenous substances in the blood is marked in renal failure largely because they are quantitatively amongst the more important substances which the kidney is normally called upon to excrete; but evidence accumulates to show that other chemical substances will show increased concentration in the blood, although to a lesser degree. Thus de Wesselow has published interesting observations on the high concentration of phosphates seen in uræmic patients, and in a more recent study he has confirmed and elaborated the work of other observers which demonstrates that even sodium chloride is excreted with difficulty, and tends to show an increasing concentration in the blood in these cases. The blood analyses in the case I have described to you were in full agreement with these findings, the actual figures in the terminal phase being as follows:—

TABLE IV.

	Blood phosphorus (normal, 2–3).	Blood chlorides (normal, about 500).
Nov. 2nd	6·3	503
„ 4th	6·2	561
„ 5th	8·3	568
„ 6th	8·5	553

Andrews has recently called attention to a curious diazo-reaction given by the blood and cerebro-spinal fluid in cases of uræmia; this reaction was positive also in my case. It has been shown by Blotner and Fitz to appear rapidly in dogs after nephrectomy, and though its significance is still obscure, it seems very

possible that this again is an example of the retention and concentration in the blood of some substance which the normal kidney would excrete. Whilst admiring the patience and ingenuity with which biochemists have inquired into these problems, we are bound, I think, to admit reluctantly that at present no direct relation has been shown to exist between the accumulation of any of the chemical bodies I have discussed and the nervous phenomena of uræmia.

Acidosis in Uræmia.

If now we turn our attention to other aspects of the blood chemistry in renal failure, we find that acidosis is almost invariably an accompaniment of this state. I use the word acidosis in accordance with the suggestion of the Medical Research Council to denote a lowering of the alkali reserve of the blood.

The work of Palmer and Henderson, of Weil and Guillannin, of Mogena and Orcoyen, may be quoted as typical observations amongst many which confirm the view that acidosis can be demonstrated in all cases of uræmia in which nitrogen retention is present and especially in those with marked nervous and respiratory symptoms. My patient with cystic disease of the kidneys was no exception to this rule, for the alkaline reserve estimated shortly after the onset of her terminal symptoms stood at the low figure of 12·6, and subsequent estimations are shown in the following table:—

Table V.—*Alkali Reserve in c.cm. of CO_2 per 100 c.cm. Plasma.*

Nov. 2nd ..	12·6	Nov. 5th, 10 A.M. ..	48·5
,, 3rd ..	13·7	,, 5 P.M. ..	55
Nov. 4th, 5 A.M. ..	20·9	Nov. 6th, noon ..	56
,, 10 A.M. ..	28·7	,, 7th (autopsy) ..	18·2
,, 9 P.M. ..	36·8		

The gradual increase in the alkali reserve which occurred in later days was the result of the administration of large doses of sodium bicarbonate which was instituted about 12 hours after the first convulsion. The effect on the patient's general condition was very marked at first, but passed off after the third day. Muscular twitchings never completely disappeared, although they became less noticeable, the general effect being a restoration to full consciousness. We must, however, observe that this amelioration was only temporary, that the muscular twitchings were never entirely suppressed, and that in spite of the improvement in the acidosis, coma and convulsions returned and became irremediable. The logical conclusion is that the condition of the blood alkali is not by itself a cause of the neuromuscular phenomena, and the absence of such symptoms in other conditions of acidosis makes it probable that here once more we have been following a false trail.

Possible Importance of Calcium.

If we resume our search for a chemical explanation of uræmia, having discarded those substances which are in excess in the blood and having put aside acidosis as an explanation, is there any other feature of the blood chemistry which may possibly throw light on the problem? Blood analysis is usually confined to a limited group of substances, but there is one amongst them which we have not yet examined, and which may have an important bearing on uræmia. I refer to calcium. We are here on very difficult ground, for though actual estimation of the calcium content of blood is not unduly difficult the problems surrounding the actual physical state of calcium in the blood, the relation, for example, between the ionised and total calcium, are extremely intricate, so that an interpretation of the figures is at present very nearly impossible. In the work of de Wesselow, which I have already quoted, attention was drawn to the diminution in the calcium content of the blood which accompanied the increase in the phosphates. Such a diminution was very marked in my case of cystic disease, the calcium of the blood, which is normally from 10–12 mg. per 100 c.cm., being reduced to 6 mg. or even less. This low figure was found to persist throughout the terminal phase of the patient's illness, and was not apparently influenced by the improvement in the acidosis which followed the administration of sodium bicarbonate. The actual calcium figures are shown in the following table:—

Table VI.—*Calcium Content of Blood.*

Normal average .. .. 10–12.

Uræmic patient	Nov. 2nd ..	6·6	Nov. 6th	5·9
	,, 4th ..	6·5	Post-mortem	8·9
	,, 5th ..	6·5		

I have already said that in the present stage of our knowledge it is impossible to draw any permanent conclusion as to the meaning of these low calcium figures in uræmia, but I think that reflection on the phenomena observed in certain other clinical states in which the calcium of the blood is reduced is somewhat suggestive.

Tetany.

The group of cases in which a distinct reduction of the blood calcium is most marked is surely that in which are to be seen the symptoms described as tetany, and tetany is found to occur in a large number of apparently dissimilar diseases, the chief of which are: (*a*) non-malignant pyloric stenosis; (*b*) parathyroid deficiency; (*c*) chronic diarrhœal states; (*d*) rickets; (*e*) poisoning by overdosage with alkalis.

I recall, for example, an interesting patient with pronounced vomiting as the result of pyloric obstruction of obscure origin. She suffered from tabes, and was at first believed to have gastric crises; but fuller investigation showed that practically nothing could ever pass through the pylorus. The barium meal upset her greatly, and after several hours, during which she was in a semi-fainting condition, she exhibited muscular irritability, and I was called to her at a time when she lay in a condition of complete carpopedal spasm with the classical flexion and extension of joints characteristic of severe tetany. A subsequent operation revealed a curious thickening at the obstructed pylorus which was possibly of gummatous origin.

Amongst other causes of tetany we must note that it has been produced experimentally in man by forced breathing over long periods, and in certain cases where the therapeutic administration of alkalis has been pushed to an extreme point. In such examples it is easy to demonstrate certain chemical factors which are constantly present and which I have endeavoured to indicate in the accompanying table.

Table VII.

Vomiting.	Forced breathing.	Overdosage with alkali.
↓	↓	↓
Loss of hydrochloric acid.	Loss of carbonic acid.	Excessive alkali absorption.

↓

Increased blood alkali.

↓

Calcium reduction and tetany.

It will be seen from examination of this table that all the cases in this group have three factors in common: first, alkalosis; secondly, tetany; and thirdly, a reduction in the calcium content of the blood.

Reverting to the conditions in which tetany is commonly encountered it is, of course, established that some connexion often exists between this condition and a deficiency of the parathyroid glands; its occurrence in certain diseases of children, such as rickets and cœliac disease, is also well known; whilst even in adults it is an occasional finding in conditions of chronic diarrhœa. Dr. Jean-Charles Roux recently showed me a very interesting case at the Hôpital Vaugirard in Paris. The patient was a woman who for many years had had constant diarrhœa, with loose stools containing a large proportion of all the ingested fat. The pathology of the case was obscure. For many months she had suffered from tetany, often latent, but sometimes showing itself acutely; its

main manifestations were always rapidly relieved by any one of the following agents: (*a*) cod-liver oil emulsion; (*b*) irradiation with ultra-violet light; (*c*) calcium and parathyroid medication.

There is, I think, a common action to each of these three forms of treatment, and this action may be briefly defined as fixation of calcium. Such a view is supported by the current conception that calcium shortage is the one common factor in all forms of tetany, and it is worth considering whether it is not possible that a true relationship may exist between the twitchings and convulsions of uræmia—which, as we have seen, are associated with a low calcium content of the blood—and the nervous phenomena known as tetany, in which calcium shortage appears to be the outstanding chemical feature. I have indicated that acidosis is usually prominent in uræmia, and we have gone on to note that alkalosis is often very marked in tetany, but that a disorder of calcium metabolism seems to be common to the two states, and that there is (as I think) a close resemblance between the neuro-muscular phenomena seen in the two syndromes, has not always been recognised.

Renal Disease of Gastric Origin.

Having drawn attention to this suggestive similarity, I will now consider for a moment whether there may not occasionally be an even closer association between gastric and renal disease than has usually been recognised. In Table VIII. I have set out some of the

Table VIII.

Progressive Renal Disease.	*Non-malignant Pyloric Obstruction.*
Acid accumulation in blood.	Acid loss from vomiting.
Acidosis.	Alkalosis.
Phosphorus retention.	Chloride loss.
Nitrogen retention.	Nitrogen retention.
Calcium reduction.	Calcium reduction.
Twitchings and convulsions.	Tetany.

outstanding features in: (*a*) cases of advanced renal destruction, and (*b*) cases of pyloric obstruction with tetany. I have already referred to an example from the latter group, and I am indebted to Dr. Hinds Howell for the information that later, whilst under his care in St. Bartholomew's Hospital, before an operation for the relief of her pyloric obstruction, this patient exhibited persistent albuminuria with hyaline and granular casts. Brown, Hartman, Eusterman and Rowntree, and Zeman, Friedman, and Mann have reported a series of cases of pyloric or upper intestinal obstruction, usually accompanied by tetany, in which routine histological examination of kidneys removed at autopsy showed entirely unsuspected changes, of a markedly degenerative nature, in the renal tubules. These changes were of the type seen in cases of mercurial poisoning, and Crohn reports the case of a patient who had undergone an operation for pyloric obstruction in whom uræmia, resulting from this renal complication, was the cause of death. I think that this rare group of cases is a very instructive one in reminding us that not only will renal damage produce profound changes in the blood chemistry, but that chemical changes in the blood may themselves exert a destructive effect upon the kidney substance.

Some Experimental Work.

It will perhaps be valuable if we now turn our attention from these purely clinical and biochemical observations to some recent experimental work which seems to me of great importance in connexion with the problems of uræmia. Of particular interest are certain experiments which have been performed in connexion with the rapid ingestion of large quantities of water in animals. In normal circumstances we are protected against a too rapid absorption of water by a series of physiological mechanisms. In the first place, thirst is quickly replaced by satiety, and even if these natural instincts are forcibly overcome the pylorus will by complete closure prevent the entrance of water into the small intestine after a certain amount had been let through. Overloading of the stomach with water is soon followed by vomiting and thus any excess in the small intestine is prevented. It would seem that there is little limit to the speed with which the small intestine can absorb water, but the renal mechanism by which it is removed from the circulation is also a rapidly acting one, and, therefore, provided that the pyloric valve exerts some degree of control it is impossible in ordinary circumstances to produce a true plethora of water in the circulation.

Rowntree and others have, however, by passing tubes through the pylorus in animals, succeeded in introducing water so rapidly into the small intestine that it was absorbed into the blood stream quicker than the animal's kidneys could remove the consequent surplus. A very interesting series of events then occurred, the animals under investigation exhibiting twitchings and strychnine-like convulsions which rapidly passed on to coma and death. It is difficult when reading the accounts of these experiments to find any distinction between the symptoms of such animals and those of patients suffering from renal failure. No one, so far as I know, has dared attempt the reproduction of these experiments on men, but it is worthy of note that in diabetes insipidus a sudden arrest of the polyuria produced by means of the administration of pituitary extract has in some instances been followed by the appearance of giddiness, twitching, and fainting, symptoms which never occur in these circumstances if the intake of water is reduced before the injection of pituitary extract.

The most recent experimental work dealing with uræmia is perhaps less convincing because of its complexity, but close examination shows that it is probably of extreme importance. Working with dogs, E. Andrews has shown that when the alkali reserve of the blood is low the injection of salt solution into the circulation fails to produce diuresis. After a short period muscular twitchings appear and from this the animals pass on to a condition in which repeated convulsions terminate in coma, hyperpnœa, and death. Examination of the blood of these animals showed definite nitrogen retention, post-mortem examination of the animals' brains demonstrated œdema, but the kidneys on microscopic section were found practically normal.

Neglecting for the moment the observations of Andrews on other aspects, it would seem that by these experiments a syndrome indistinguishable from that of uræmia is produced by the injection of sodium chloride solution in the presence of acidosis, without any renal lesion being present before or after. And it is worthy of interest that this worker reaches the conclusion that it is largely owing to the disturbance of calcium metabolism that the convulsive symptoms are produced. In an incomplete, but suggestive, series of experiments he has been able to suppress the convulsions of these animals by the intravenous administration of calcium in large doses.

Conclusion.

I have now touched on many of the chemical factors which, at the present stage of our knowledge, appear to be of major importance in the problem of uræmia. That my review must be extremely incomplete I am well aware. And particularly I am conscious of two very important omissions: first, I have made no reference to the relative conditions of the blood and of the cerebro-spinal fluid; and secondly, I have not endeavoured to deal with cerebral œdema as a possible factor in the production of uræmia.

As regards the cerebro-spinal fluid, it is obvious that by studying its chemical state we have better knowledge of the chemical conditions in the central nervous system than if we study the blood alone; but the difficulty of collection is a great handicap in such investigations, and has prevented that frequent repetition of observations which is so easy in the case of the blood. The analyses which were secured on the cerebro-spinal fluid in the case of my patient with cystic disease gave figures similar to those in the blood, as far as we could ascertain, but usually less

marked in degree, there being probably some lag in the appearance of concentrated retention products in the central nervous system; but the impossibility of taking many specimens makes me hesitate to speak more precisely than this. To cerebral œdema I shall refer in a later lecture; for it seems appropriate to discuss this question when dealing with the general problem of œdema.

In the study of medicine we should, said Bright, cultivate a chastened power of generalising our ideas. And if my dissection has dealt with chemical as much as with anatomical peculiarities it is because I feel that it is in that direction that we can most fruitfully pursue our inquiries into the problem of uræmia. Ninety-five years ago, when delivering these very lectures, Bright again and again dwelt on the importance of the chemical aspects of these problems. "If the deranged action of the kidneys," he said, "continue long, the urea can be detected by the chemist's art in the course of the circulation," and in later passages he gave full credit to his friend, Mr. Rees, who was "ardently pursuing the subject of animal chemistry." To-day we are no less dependent on the help of our friends in the laboratories, and I feel it proper to conclude this lecture by expressing my indebtedness to that group of colleagues from whom I have always received such unselfish assistance in the exploration of these difficult problems.

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ON THE STATISTICAL EPIDEMIOLOGY OF RESPIRATORY DISEASES.

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DEATHS from diseases of the respiratory system form the second largest group of causes of death in this country. The two main headings in this group are bronchitis and pneumonia. This paper considers how these two diseases have varied in time and in place and some of the factors influencing the mortality. The history of pneumonia dates back to very early times, but the accounts given by some of the ancient writers are not sufficiently clear for identification of the clinical or pathological variety. In his record of diseases at Thasos, Hippocrates[1] found that epidemics of the pulmonary and catarrhal diseases were commoner in the spring of his First Constitution. Pneumonia was often confounded with pleurisy by the old Greek physicians; to Galen, 500 years after Hippocrates, belongs the credit of differentiating them. In the seventeenth century Sydenham gave the first clinical description of broncho-pneumonia,[2] and Morgagni identified the clinical features of pneumonia with solidification of the lungs. At the beginning of the nineteenth century the Bohemian, Carl Rokitansky, defined lobar and lobular pneumonia. According to Ewart [3] the affections of the bronchial system had no separate history before the beginning of the nineteenth century, when Badham, in 1810, introduced the name bronchitis and Laënnec gave his masterly description of bronchitis and pneumonia. But, as we shall see later, the distinction between these two diseases was by no means accurate until quite recent times.

Epidemics of Pneumonia.

The disease has been described in epidemic form from the Middle Ages onwards, and in the opinion of authorities such as Allbutt and Rolleston, the type of disease recorded in these epidemics was more like pneumonia than any other disease. In their "History of Pneumonia" Sturges and Coupland[4] concluded:—

> "We can say no more than that these ancient epidemics resembled generally certain prevalent fevers of later date, in which symptoms of lung mischief occupy a prominent place and death discloses engorgement or consolidation of those organs. The earlier part of the sixteenth century was remarkable for a series of epidemics apt, under certain conditions, to assume this character."

A summary of Hirsch's [5] detailed account of the epidemics of pneumonia in Europe is given below.

The first information on the epidemic prevalence of inflammation of the lungs was in the sixteenth century. Epidemics were recorded in Italy, Germany, the Netherlands, Switzerland, and France, but Italy appears to have been the centre of the epidemics; in fact pneumonia has always been very prevalent in Italy right up to modern times. In the winter and spring of 1601–02 a very severe epidemic of malignant pneumonia prevailed in Italy, and during the seventeenth century outbreaks were recorded in 1610, 1612, 1633, 1696, and 1698. In 1624 there was a severe outbreak in Germany, chiefly affecting children. In Switzerland epidemics were observed in 1652, 1685, and 1695. Opinions were divided as to the contagiousness of the disease; the question of transmissibility in epidemics of pneumonia was raised and debated by many Italian writers in the seventeenth century, but they were unable to come to a decision.

There is ample evidence of epidemics of pneumonia in the eighteenth century, particularly in Italy, Switzerland, and France. The earliest accounts of severe epidemics of pneumonia in the United States and Canada date from the eighteenth century, and the earliest records of malignant epidemics of inflammation of the lungs in England, Spain, and Denmark belong to this period. In France pneumonia was prevalent in pandemic form during the latter half of the century and nearly all the epidemics occurred in the winter and spring. In Spain pneumonia was first described in 1734 and it was widely diffused during the autumn and winter of 1735–36 and 1736–38. In Italy and Switzerland it appears to have been prevalent at intervals throughout the century. For Great Britain we have accounts of the epidemic prevalence of severe forms of pneumonia in Fife in the winter of 1736 and Huxham's account of the outbreaks at Plymouth in the winter and spring of 1733, 1740, and 1746. Of the pneumonia epidemic in 1733 Huxham [6] said that in March "in the beginning of the month the catarrhal fever was everywhere vastly epidemic, which still continues, and now also Squinzies, Pleurisies and Peripneumonies, both of the true and bastard kind are frequent." In April he noted: "the epidemic fever is still up and down the country and many are now in a consumptive way from the ill-effects of it and an unfavourable crisis: Many are seized with Pleurisies and Peripneumonies." In the records of nearly all the epidemics in Europe during the eighteenth century attention is drawn to the malignant type of the disease and its so-called typhoid symptom.

Early in the nineteenth century rather more definite views were held about the term "pneumonia" after Laënnec had given a clear definition of the two diseases bronchitis and pneumonia. Our records of deaths from these two causes in England and Wales show that there was much interchange of certification between pneumonia and bronchitis, and we cannot study the statistics of the two diseases separately—at any rate not for the nineteenth century. Stevenson [7]

showed this quite definitely in his analysis in the decennial supplement 1901–10. He considered that—

"Comparison of the mortality returns from the two causes at different times leaves no doubt that the bronchitis of to-day may be the pneumonia of to-morrow, and vice versa, though the main change in the period covered by Table 10 (1861–1910) has been one from bronchitis to pneumonia."

He examined the death-rates for different periods of life from 1901–10 back to 1861–70, and, broadly speaking, he found that the changes which have occurred in the recorded mortality from pneumonia and bronchitis are largely attributable to transfer between the two diseases, partly because of the fact that the extreme reduction of bronchitis mortality is so nicely balanced at each age by just the rise in pneumonia mortality required to reduce the decline from the two causes to moderate dimensions. There is just one exception, and that is at ages 15–25 in the case of males, where the rise in pneumonia mortality is unbalanced by a fall in bronchitis mortality. Two epidemics of pneumonia in the nineteenth century were the subject of special reports to the Local Government Board. One was reported by Ballard [8] at Middlesbrough in 1888, when 1633 persons were attacked in a population of 97,000 and there were 369 deaths. The second report by Parsons [9] was on the epidemic at Scotter in Lincolnshire in 1890.

The standardised rate of mortality from bronchitis and pneumonia from 1861–1911, given in decennial periods in the Registrar-General's decennial abstracts, shows that the combined mortality from these two diseases for males increased rapidly between 1861 and 1880, then more slowly to a maximum in 1881–90, followed by a decline in 1891–1900 and a big drop in 1901–10.

Standardised Death-rates per Million Living.

Year.	Males.	Females.
1861–70	2923	2436
1871–80	3415	2815
1881–90	3433	2778
1891–1900	3342	2693
1901–10	2679	2142

The maximum mortality for females was reached in 1871–80. It should be noted that the rules of certification of the deaths discussed here only include those in which pneumonia or bronchitis was alone recorded on the certificate or associated with another cause of which they take precedence under the rules of tabulation. Under the revised rules of 1901 pneumonia was given priority over local diseases, and this doubtless increased the number of deaths tabulated under pneumonia. Under the present rules certificates returning measles and broncho-pneumonia would be tabulated under measles and those recording influenza and pneumonia under influenza.

Climatic Conditions and Pneumonia.

The increase in mortality from bronchitis and pneumonia during the middle of the nineteenth century was frequently commented on by Farr. He thought that much of it was due to the dust and smoke of cities, and in 1869 he asked whether factories and kitchens could not largely consume their own smoke—a question which has been frequently asked since. He also spoke of the risk from atmospheric temperature and compared the annual deaths from respiratory diseases by month in London with degrees of temperature. He concluded that the fatality from these diseases was directly influenced by cold weather. The question of the relation between unfavourable climatic conditions and the death-rate from respiratory diseases is discussed and various conjectures are made in almost every report on pneumonia and bronchitis. The seasonal curve of mortality is well known. Fig. 1, which is copied from the Registrar-General's annual report for 1925, shows the mean annual death-rate from respiratory diseases for 1921–25 plotted against the mean monthly temperature for these years. In order to compare the two curves the temperature scale has been inverted. The curves are very similar; the winter rise in mortality from respiratory diseases corresponds to the fall in temperature, and with the rise in temperature in the spring there is a decline in the respiratory death-rate. But the month of maximum mortality is not in the depth of winter, the coldest months of the year, but in February, the time of greater variation. Probably the most valuable recent work on the subject of climatic conditions and mortality is that of Huntingdon,[10] who thinks that a variable climate is that most productive of health and efficiency; he has collected data to prove that the ideal climate is that enjoyed by the inhabitants of England and Wales. One wonders whether he would consider the climate we have experienced during 1927 as an ideal one. Perhaps we are really no worse off now than 200 years ago; for example, this is Huxham's [6] monthly report of the weather in 1734.

June.—An easterly wind blew almost daily from the 6th to the 20th.

July.—Fair but cold at beginning of month, middle of month south-west wind with rain, then north wind returned. Later an immense quantity of rain fell.

August.—Fair at beginning, but about middle of August very much rain and too much also at the end of it.

This would not be a bad account of the weather for the same months of 1927.

Temperature and the Pneumonia Mortality-rate.

We will consider first the quantitative relation between temperature changes and the mortality-rate from pneumonia. The Medical Statistical Staff of the Ministry of Health investigated this point in some detail and tried to estimate how many deaths might be expected on the average with changes of temperature. Most of the work was done for the report on Influenza of the Ministry of Health, and those who are interested in the relation of weather and epidemic disease should read Chapter VII. of the report. The doctrines of Hippocrates, Galen, Sydenham, and others are set out and some of their arguments are discussed.

The data used were confined to the registration districts of London and to the periods 1850–89 inclusive, because no records could be found of air temperature for any other large town in England for many years. The period was limited to 1850–89 because there were no influenza epidemics during this period; since 1890 there have been several epidemics, which would have affected the pneumonia death-rate. The death-rate from all forms of pneumonia in each of the first 12 weeks of the year was computed for the 40 years and correlated with the mean temperature of the air in the preceding week—i.e., a correlation table was formed from the 480 pairs of observations and 2° was taken as the unit of grouping for temperature and 4 per million for the death-rates. The correlation was quite significant—$-\cdot371 \pm \cdot026$. From the regression equation it was calculated that a drop of 1° Fahrenheit in the temperature corresponded to a rise in the pneumonia death-rate of the next week of about 6 per 10 million living. The calculation was repeated for the last 12 weeks of each year from 1850–89 and also for the years 1903–14 (135 observations). The correlation between pneumonia and temperature for the fourth quarter of the years 1850–89 was $-\cdot458 \pm \cdot024$. Now we come to the interesting result that in the recent period, 1903–14, the correlation between the pneumonia death-rate and the temperature of the previous week was much higher than in the pre-influenzal period 1850–89. This time the correlation was $-\cdot707 \pm \cdot029$. Regression lines were fitted to the data and the slope of the line for the last period was much steeper than for the earlier period—a greater difference than could be expected from chance fluctuation.

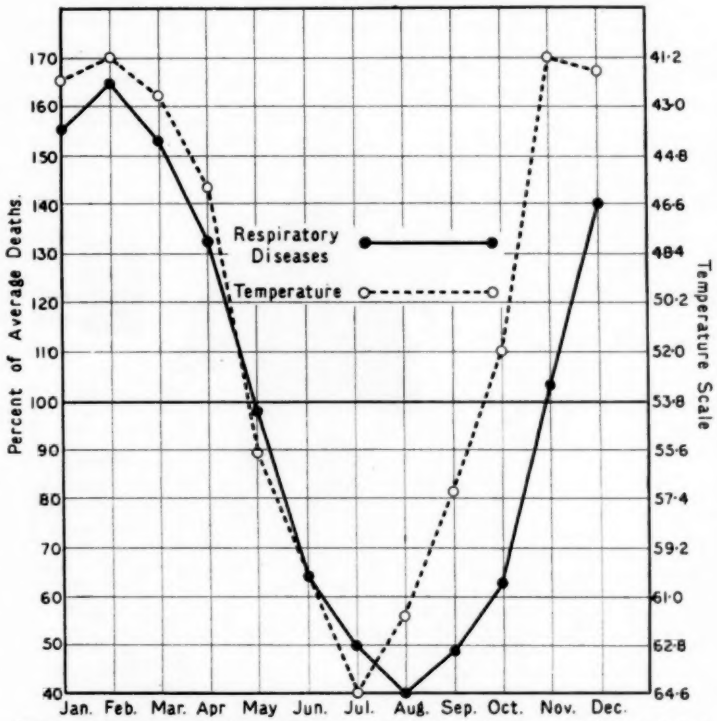
The absolute magnitude of variations of death-rate with temperature is not large and the irregularity of the trend is considerable, but it looks as though the pneumonia of recent years has varied more closely with temperature changes than in the earlier periods. No correction was made for trend in this first analysis. For the next stage of the inquiry deaths from bronchitis and pneumonia were combined and allowance was made for seasonal variation, by referring every death-rate and every temperature in each week of the 52 weeks of the years to the mean rate of mortality and the mean temperature of the week of the year to which it belonged—that is, deviations of mortality from their

norms were correlated with deviations of temperature from their norms.

For example, suppose that for the 40 years of the series the mean death-rate from the respiratory diseases in the third week of the year was 109 per million, and the death-rate in one particular third week was 93 per million, the difference between 93 and 109 is −16, then −16 was entered in the correlation table against the corresponding difference between the temperature and its mean for the same week for the 40 years. Following this method throughout for all the weeks of the 40 years one had 2087 observations. Now one proceeded to try to answer the following questions: What is the relation between temperature of the week and the respiratory death-rate for the same week, temperature of one week and the respiratory death-rate of the next week or the week a fortnight later? These were the correlations: temperature and death-rate of the same week $-\cdot231\pm\cdot014$; temperature and death-rate of the next week $-\cdot477\pm\cdot011$; and temperature with death-rate of fortnight later $-\cdot405\pm\cdot012$.

The closest relation is therefore between the death-rate and the temperature of the previous week. The regression equations showed that a drop of one degree of air temperature below the mean temperature of the week was associated on the average with an increase of 2·5 deaths per million living above the normal average of the following week's mortality. But the relation was not sufficiently stringent to be of any real value in prediction. The conclusions from these investigations were that if the temperature falls below the normal of the season of the year, on the average, the arithmetical increase of mortality will be 2·5 per million living, but so many other known and unknown factors are involved in any particular week that the actual result may depart considerably from its average value.

FIG. 1.



Showing the mean annual death-rate from respiratory diseases for 1921–25 plotted against the mean monthly temperature for these years. Copied from the Registrar-General's annual report for 1925.

Fog and Respiratory Mortality.

Fog has been frequently spoken of as an important factor in respiratory mortality. Leonard Hill has emphasised the evil influence of smoke and fog upon health, partly because of the obstruction of sunlight. In 1925 the medical officer of health for Glasgow [11] attributed the increase in the respiratory death-rate during November to the fog which prevailed during the month, and which became dense during the four days Nov. 18th–21st. He reported that—

"During the four weeks ending Nov. 28th, 1468 deaths were registered as compared with 1224 for the same period last year. This increase referred almost entirely to the last two weeks of the month—i.e., during the fog week and that following—when the death-rates became 18·7 and 21·0 respectively, against 15·6 and 16·6 for the same weeks of last year. The number of deaths of children under 5 years of age was practically unaffected, the increase in the mortality over last year being largely confined to those over 60 years of age. The fog thus affected principally older people. It will also be noted that the mean temperature before and during the period of fog was low—35·8°, 36·3°, and 36·1° for the three weeks ending Nov. 28th."

He goes on to say that this appears to indicate that when fog is associated with low temperature the respiratory death-rate among older people is influenced very considerably, although its effect is not evident in the case of children. But if we try to obtain a precise numerical evaluation of the bad effects of smoke and dust, there are very serious difficulties. We cannot definitely show that a rise in mortality is the direct action of fog, any more than we can demonstrate the absolute influence of temperature on the death-rate. Russell's [12] investigations are the only ones in which an attempt has been made to put the relation of fog on a quantitative basis. He shows that the numerical measure of fogginess is by no means a satisfactory one. He examined the influence of fog and temperature on the weekly mortality from respiratory diseases among children and adults during the winter months in two metropolitan boroughs—Islington and St. Pancras—over a period of 21 years. His conclusions were that fog itself has no appreciable effect on the death-rate, but if fog is associated with a low temperature and frost the respiratory death-rate of adults can be influenced very considerably, but there is not much effect on the mortality of young children. He gives, as illustrations, the experience of the two London boroughs between October and March in 1883–84 and 1892–93. In both periods there were considerable outbursts of fog in November and December, the fog records of the two periods being not dissimilar. But in 1883 there was no obvious increase of mortality after the fogs. In 1892 there was a large increase, and in that year the fog was associated with a sharp fall of temperature not occurring in 1884. His conclusions to his second report sum up very clearly the relative importance of fog and temperature:—

"It is essential to bear in mind that, in any study of the influence of weather on the prevalence of disease, the assignment of the increased mortality to any particular factor is not nearly so simple as is generally believed. The fact, often overlooked, is that there are a multiplicity of causes, both atmospheric and meteorological, all of which are highly inter-related, and it is the cumulative effect of these, and not the influence of an individual factor, that finds expression in an increased death-rate from respiratory disease."

The same point is strongly emphasised by Sir George Newman [13] in the following sentence :—

"The true inference is, I believe, that in the matter of atmospheric pollution, as in that of meteorological factors, the inter-related variables in any given case are so numerous that only by means of a far longer series of observations than our data provide can any valuable statistical conclusions be reached."

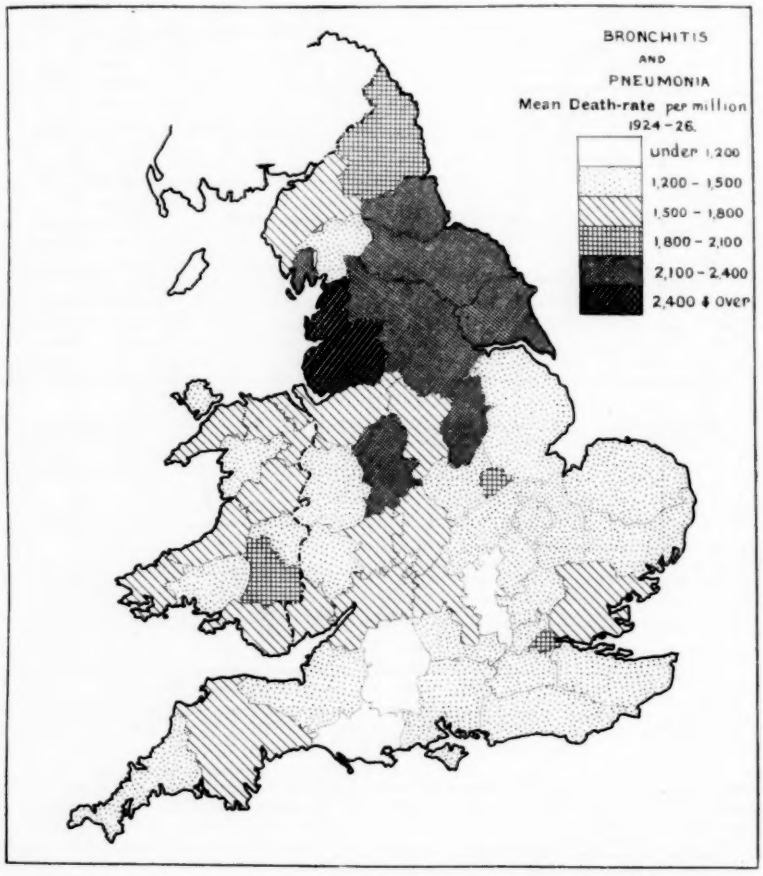
So far as Russell's data were concerned it seemed warrantable to conclude :—

"1. That although the number of respiratory deaths in the following week was more highly correlated with the fogginess than with the temperature of the previous week over certain periods, yet, on the average, a low temperature exercised the greater influence.

"2. That knowing the temperature and the amount of fog, it is possible to predict the mortality of the succeeding week, but only within a marginal error of roughly 30 per cent."

Thus in atmospheric pollution as in meteorological factors the number of inter-related variables are so numerous that we cannot measure the influence of any one factor with any certainty, but as Sir George Newman [13] pointed out, all the statistical evidence points to sharp changes of temperature, particularly in their effect upon the aged, as the real basis of the evil reputation of climate in relation to respiratory disease.

FIG. 2.



Map showing the relative distribution of mortality from bronchitis and pneumonia, 1924–26.

The Age Factor.

It is very important to study the influence of external factors on the mortality from respiratory diseases at different age-periods, as Russell has done. From various investigations that have been made it is quite clear that such factors as social and climatic conditions as far as we can measure them do vary considerably in their fatal effect on mortality at different ages. Young [14] found that meteorological factors had very little influence on the mortality of children under 5. The present writer [15] made a similar analysis and found a definite association between temperature and mortality at ages 40–60 and 60–80, that the lower the temperature the greater the mortality from pneumonia at these ages. I found also that environmental conditions were an important factor of the mortality among children under 5, whereas these factors were of much less importance in middle life and of little or no importance in later life.

A feature of pneumonia and bronchitis is that they are extremely fatal at both extremes of life. The distribution of deaths by pathological type is as follows: deaths from lobar pneumonia are rare at ages 0–5; 80 per cent. of the deaths are due to broncho-pneumonia at this age; nearly half the deaths from pneumonia at ages 45–64 are ascribed to lobar pneumonia, while at ages 65–74 more deaths are due to broncho-pneumonia. One of the most interesting epidemiological features of the mortality from respiratory diseases in England and Wales is the variation of the mortality in the different areas. In 1926 the rate of mortality from pneumonia varied from 486 per million in the rural districts of the south to 1169 in the county boroughs of the north. In 1913 Stevenson commented on the striking differences in the mortality in the following terms :—

"Apart from London, where it is fairly high, the mortality steadily decreases from north to south in all classes of area and in both sexes, the position of Wales being generally intermediate between the North and the Midlands. The range of mortality is extreme, being almost four times as great for males in the county boroughs of the north as for females in the rural districts of the south and three times as great when males alone are compared. Even when comparison is restricted to the same class of area in each case the mortality of the north is in no instance very much less than twice that of the south. No doubt this depends to some extent upon industrial conditions, but these can scarcely explain the great difference between the North and the Midlands. Evidently pneumonia is to a large extent a preventable disease, and the north of England has still much to learn with regard to its prevention. It is a striking fact that all these statements as to relative mortality copied verbatim from the Report for 1912 apply equally to the year 1913."

The mortality from bronchitis and pneumonia in 1926, as compared with that in 1913, was much lower, but the remarks as to the relative distribution in the country are still valid (see map, Fig. 2). The statistics of notifications of pneumonia also point to the unsatisfactory position in the north, particularly in

the north-west of the country—in Lancashire and Cheshire. The excessive mortality from pneumonia in the north of England might be attributed to the harsher climate, but the great variation between the mortality in separate districts of the north makes it evident that climate is not the whole explanation. Greenwood [16] showed that, although economically the working-class families of Bolton and Warrington were better off than the Reading families, the rate of mortality from all causes was far higher in Bolton and Warrington than in Reading. The chief discrepancy in the adult mortality was with respect to pneumonia. Industrial conditions in the north are probably the explanation, because of the evil effect of dust and smoke and lack of ultra-violet rays. Lancashire and Cheshire are mainly industrial, and with the present factory conditions the air is heavily polluted with smoke and dust all through the year. Hill estimated that as much as 50 per cent. of the sunlight in Manchester was cut off by smoke and no less than 40 per cent. in Leeds. The deposit of soot in Manchester [17] for the year ending March, 1922, was 480 tons and as much as 697 in Rochdale; in Malvern there was only 69 tons during the same year. Probably the best known work on the influence of dusty occupation on the health of the worker is that of Collis, who considers that—

"Dust which impairs the vitality of the lungs predisposes to tuberculous infection . . . and at the same time predisposes to other respiratory diseases."

He has shown that dust formed from the husk of vegetable fibres tends to cause a typical form of asthma associated with bronchitis. Bronchitis follows upon inhalation in excess of practically every form of dust which is insoluble and non-colloidal. Pneumonia, although its association with dust inhalation is not as marked as that of bronchitis, may result from inhalation of the same dusts as cause bronchitis.

It would take too much space to go into the details of the various investigations Collis has made, but these are some of his general conclusions given in a report [18]: "The General and Occupational Prevalence of Bronchitis and its Relation to other Respiratory Diseases":—

For coal miners generally the bronchitis and pneumonia rates are high, with the exception of Northumberland and Durham, while men working on the coal face experience higher mortalities from phthisis, pneumonia, and bronchitis than do other miners. Exposure to heat and fumes seems to have a definitely bad effect with regard to bronchitis and a similar, although less pronounced effect with regard to pneumonia. Bronchitis and pneumonia are high among cotton operatives and rope makers and especially high among cotton strippers. Woollen workers, carpet makers, millers, and carpenters, on the other hand, show no excess of either bronchitis or pneumonia. Occupations in which there is exposure to silica dust, such as potters, cutters, sandstone, and tin miners, all show a high mortality from respiratory diseases. All these results are based on the rates of mortality for males at working ages 25–64 and therefore do not include the old-age mortality.

Since cotton manufacture is a great north-western industry, the high rates of mortality from bronchitis and pneumonia in that area suggest that the workshop conditions are to a large extent responsible. The fact one cannot get away from in studying respiratory diseases is that so much of the mortality is preventable, and the industrial towns of the north have still very much to learn with regard to its prevention.

No one will dispute that skilful nursing is the essential treatment. In London during 1920 only 18 per cent. of 5315 deaths from pneumonia occurred in hospital and nursing homes, and 22 per cent. in poor-law institutions. As many as 60 per cent. of the deaths occurred outside these institutions—in other words, at home. In a recent report by the Ministry of Health on Scarlet Fever and in the annual report of the Chief Medical Officer for 1923 it was stated that—

"The time has come when the whole question of using isolation hospitals to greater advantage calls for the consideration of local authorities, and it may well be that fuller regard should be paid to patients suffering from respiratory diseases."

If greater provision were available in hospitals for the treatment of respiratory diseases much of the mortality might be reduced.

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AN IMPROVED TECHNIQUE FOR THE TREATMENT OF INTERNAL HÆMORRHOIDS BY INJECTION.

By ARTHUR S. MORLEY, F.R.C.S. ENG.

THE treatment of internal hæmorrhoids by means of injection has been making steady strides since the attention of the profession was forcibly attracted to it in 1914. It is becoming known to an ever-increasing number of medical men and to the lay public. In the first paper which I published on the subject [1] in 1916, and in my book on Hæmorrhoids,[2] I described a method of treatment by injection of a 20 per cent. solution of phenol in equal parts of glycerine and water, in this respect following the practice of most of those who had previously practised treatment by injection. This solution was injected into the centre of the pile-mass. Some other surgeons, and notably Dr. Dudley Wright, used a 10 per cent. solution of carbolic in the same way.

Since 1914 I have treated not less than 5000 cases of hæmorrhoids in this way, and the results have been extremely satisfactory on the whole, both to the patients and to myself. I am still in touch with a good many patients whom I treated in 1914 and 1915, and I hear of a great many more through friends whom they recommend to consult me.

My peace of mind has been disturbed from time to time, however, by certain complications which have occurred. The chief of these was severe pain, coming on some 48 hours after an injection, and usually due to sloughing of part of the pile-mass. This sloughing occurred only in about 1 in every 200 cases, but it led to really intense pain, which frequently lasted for more than a week. In other cases—some attended with this sort of pain and some without it—rather alarming secondary hæmorrhage took place. This complication occurred, according to calculations from statistics of my own cases, in about 0·25 per cent. of cases. It was due to slight sloughing opening up a blood-vessel of appreciable size. I have never met with a fatal case of hæmorrhage after injection, but in several cases the bleeding was sufficiently severe to be very alarming and to leave the patients debilitated. As a great many of my patients come to me from all

[1] THE LANCET, 1916, i., 617.

[2] Hæmorrhoids, their Ætiology, Prophylaxis and Treatment by Means of Injections. London: Henry Frowde, Hodder and Stoughton.

parts of the country and are out of reach in case of the necessity for prompt attention, the possibility of these complications, even in so small a proportion of cases as 1 in 200, troubled my mind considerably. Moreover, their occurrence did the method considerable harm, because the patients in whom they occurred and the medical men who were called in to deal with them naturally did not realise that complications are the exception and not the rule.

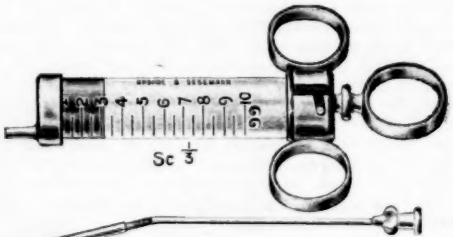
I first considered the advisability of using a weaker solution of carbolic; but I had met many patients who had been relieved promptly of all their symptoms by an injection of 20 per cent. carbolic, after other surgeons had failed to give them relief with more than the usual number of injections of 10 per cent. solution; and, moreover, although still more rarely, the same complications did occasionally arise even with the weaker phenol.

Improved American Technique.

This was the position at the end of 1926. At about that time it came to my knowledge that a different technique was being employed by proctologists in the United States, notably one which had been used very largely by the late Dr. J. D. Albright, of Philadelphia, and by Dr. C. E. Blanchard, of Youngstown, Ohio. I communicated with the latter surgeon, and he very kindly sent me various papers and a copy of his book,[3] in which the American technique is described in detail. Since early in 1927 I have been using this new method almost entirely, and, whilst the ordinary symptoms of internal hæmorrhoids—bleeding and prolapse in particular—have disappeared with the same certainty after the first one or two injections, the occurrence of severe pain and of secondary hæmorrhage has entirely ceased to worry me. In a letter which Dr. Blanchard was good enough to write to me in 1926, he remarks, " . . . you in England are about where we were in 1912—annoyed by troublesome complications, pain slough, &c. I have called this our grey-hair-making days." From the experience I have had of the improved technique, I am so much impressed by the absence of troublesome complications that I do not think that Dr. Blanchard's picturesque description is altogether beside the mark.

The chief differences between the two methods are that in the older one a few drops of a 20 per cent. solution of carbolic were injected right into the centre of the pile-mass, the solution being in water and glycerine; in the improved method a large quantity (some 1 to 3 c.cm.) is injected *submucously*, carefully avoiding entering the needle deeply and any risk of penetrating large vessels. The syringes which I used for injecting the 20 per cent. carbolic solution are far too small for the new method, and one holding about 10 c.cm. is necessary. Dr. Blanchard uses a gold needle fixed on a long straight stem, and provided with an adjustable screw guard, which can be set so as to allow the desired length of needle to be exposed. I have modified Dr. Blanchard's pattern of syringe, and have had one made by Messrs. Krohne and Sesemann, of Duke-street, W. 1, to my own pattern. This syringe is an ordinary 10 c.cm. " Record " syringe, with an eccentric nozzle. The barrel may be made of glass, if preferred, but glass barrels are liable to frequent breakage through boiling, so I now use a metal barrel, and there is nothing to break or to get out of order. I use a gold needle similar to Dr. Blanchard's, but with the stem bent to an " elbow " just above the guard. This keeps the point of the needle, when in use, always in view, and renders the injection very much easier than with a straight shaft. Since the syringe is a " Record," the shaft of the needle plugs on without any screw or washer, but the fit must be very good in order to obviate any risk of the syringe and shaft of the needle parting company whilst the injection is being made. The guard is not essential, but it prevents any chance of the needle being inadvertently introduced further than is intended. The gold needle does not rust nor wear out, and is easily sharpened.

The solution recommended by Dr. Blanchard is a 5 per cent. solution of phenol in any *vegetable* oil. Animal oil is absorbed too rapidly, and mineral oil—e.g., liquid paraffin—stands in the tissues too long, like a foreign body. Dr. Blanchard uses an oil called in America " Wesson oil." I have not been able to identify this with any oil in England, but I fancy it corresponds with what is known here as Lucca oil. I use pure almond oil, which seems to answer the purpose perfectly. Olive oil would do, but is rather too thick to flow freely through the needle. I have also used cotton seed oil, but I gave



A modified " Record " syringe and gold need'e.

it up because in some patients it seemed to produce temporary headache and malaise, which do not occur when almond oil is used. If many cases are to be treated it is convenient to keep a 25 per cent. stock solution of carbolic in the oil. Pure phenol crystals should be used, and liquefied over a water bath; 1 part of the liquefied crystals to 3 parts of pure almond oil make a 25 per cent. solution. To this solution 10 grains per ounce of menthol crystals may be added. This addition was recommended by the late Dr. Albright, who regarded it as an analgesic and thought that it prevented nausea. It seems a little doubtful whether it is necessary, but I have not tried the oil without it, so I cannot speak from experience. To make up the " working solution," all that is necessary is to add 1 part of the stock solution to 4 parts of almond oil. This makes a 5 per cent. solution, of which it is convenient to prepare from 4 to 8 oz. at a time, which is sufficient, as a rule, for some 20 cases. I label my 5 per cent. solution " P-O 5 per cent." (phenol oil 5 per cent.). It keeps indefinitely, and, in consequence of the presence of phenol, it is always aseptic. I also keep a 10 per cent. solution ready prepared, but I very rarely use it, reserving it only for cases in which there is an exceptionally great tendency to hæmorrhage, which does not yield, as usual, to the first one or two injections.

Technique.

Dr. Blanchard works through a speculum known as Brinkerhoff's speculum, which is very long and tapering, rather like Mummery's speculum, but very much longer and with a slide over the fenestra. I do not like this instrument, because only one pile at a time can be seen through it, and it is therefore difficult to get a clear view of the parts. I find a Kelly's speculum, such as I have described elsewhere (loc. cit.), the handiest instrument for the purpose.

At the first treatment the injection should be made high up, at the extreme upper end of the hæmorrhoid, and for this purpose it is often necessary to go almost as high as the lowermost Houston's valve. It is for this reason that the long shaft to the needle is necessary. The needle should be inserted just under the mucous membrane so that the oil is injected into the submucous coat. On no account should any attempt be made to inject it into the centre of the pile-mass or into the vascular plexus in the middle of the pile. The injection is made slowly. No directions can be given as to the precise quantity to inject. When enough has been used, the pile can be seen swollen and whitened, and the precise point at which to stop is the moment when the superficial vessels can be seen as very fine red threads

[3] An Epitome of Ambulant Proctology. By Chas. Elton Blanchard. Medical Success Press, Youngstown, Ohio.

running over the surface of the whitened hæmorrhoid. This is what Dr. Blanchard calls his "striation sign," and it is the guide to the ideal amount of fluid to inject. A few drops more or less are of no great importance, however, and it is only by experience and judgment that the correct degree of distension of the hæmorrhoid can be gauged. Every pile is dealt with similarly at each sitting. At subsequent sittings one works lower until one reaches the proximity of the muco-cutaneous junction. Great care must be exercised not to encroach upon this, or pain will inevitably follow. For the same reason care must be taken not to inject a great excess of fluid into any pile, because the solution is apt to gravitate downwards, and, if the treatment is pressed too vigorously, the oil may find its way under the skin and cause pain.

The interval between the injections may be from five to seven days. Usually five injections at these intervals are required. As with the older method, the symptoms almost invariably disappear from the moment of the first injection, and at the second visit the patient usually greets the surgeon with some such remark as, "Marvellous, you are a perfect wizard!" So rapid and absolute is the relief of symptoms that, as in the case of the 1 in 20 carbolic solution, a frequent difficulty is to persuade the patient that further injections are really necessary. If sufficient injections are not given, however, the symptoms are likely to recur after a few months of comfort. During the summer of last year I was away for six weeks, and on my return I resumed the interrupted treatment of a great many cases. Those who had had only one injection before I left London had remained comfortable, but symptoms were just beginning to reappear in several patients, and in all of them the piles were larger than I am accustomed to find in patients who have had a similar number of injections without any break. It is not as easy with this method as with the older one to decide exactly when enough treatment has been given, because the oil remains standing under the mucous membrane for a considerable time, and its pressure leads to considerable inflammatory thickening and consequent hardening of the piles. After about five injections, however, the piles have diminished very sensibly in size, and, if their remains are of parchment-like hardness from their upper limit down to the muco-cutaneous junction, it is safe to consider that treatment has been sufficient. Here, again, it is difficult to lay down precise directions in words; it is largely a matter of experience at what precise point to stop treatment with confidence that recurrence is very improbable. It is better to give one or two more injections than to let the patient go on his way rejoicing before he has really had enough.

The Pathological Effects.

The pathological effects of this method require working out more fully. As far as I can see, the oil remains unabsorbed for a considerable time and sets up an aseptic inflammatory reaction between the mucous and muscular coats of the rectum with subsequent formation of dense scar tissue, which binds these coats closely together. The oil, whilst still standing in position and distending the mucous membrane, keeps up a very considerable degree of pressure on the vessels in the pile-mass, and the scar tissue which forms at a later stage must tend by its contraction to obliterate any vessels which have escaped the effects of the pressure by the oil itself. If the needle is inserted properly, only just beneath the mucous membrane, no oil can get into any macroscopic vessel, and I have never seen nor heard of any trouble from oil finding its way into the circulation. Nor is there ever any trouble from hæmorrhage at the time of the injection, such as used to happen occasionally when the solution was deliberately introduced right into the centre of the pile-mass. Indeed, hardly a drop of blood escapes during the injection—no more than after ordinary hypodermic or submucous injections.

Symptoms of carbolic acid poisoning might be expected, but I have never seen any, and I have never found carboluria or other sign of carbolic acid absorption. The explanation is that the oil is absorbed extremely slowly; it has not disappeared from the sites of injection at the end of a week. In a few cases, where rather more of the oil than usual was used, there has been giddiness and "muzziness" when the patient gets off the couch. This has always passed off in 15 minutes, and is probably due rather to the menthol than to the phenol. In the very few cases in which I have used a 10 per cent. solution instead of the usual 5 per cent. there has been some pain and aching, and some of the patients have complained of feverishness and malaise. Whether these symptoms can be considered as mild symptoms of carbolic acid poisoning I do not know.

Complications seem to be rather like "snakes in Ireland"—they do not exist, beyond the very trivial ones referred to above. There is usually a certain amount of aching, which comes on about an hour after an injection and lasts for three or four hours. It is easily relieved by aspirin, phenalgin, or other drug of that type, and few patients complain much. If one has injected considerably more of the solution than is prudent, a little surface ulceration may occur, but I have not seen any real sloughing since I have used the new solution.

The treatment is suitable to all cases of internal hæmorrhoids, although where there are complications, such as fissure or strangulated irreducible piles, preliminary treatment by divulsion of the sphincter may be necessary.

Summary.

1. Use a 5 per cent. solution of phenol in vegetable (e.g., almond) oil. 2. Inject the solution under the mucous membrane and not into the pile-mass. 3. The quantity injected into each pile is usually from 1 to 2 c.cm., using Blanchard's "striation sign" as a guide. 4. If the injection is properly made, no bleeding follows with the withdrawal of the needle. 5. Continue the injections at intervals of from five to seven days until each pile is of parchment-like hardness from its upper extremity to the muco-cutaneous junction. 6. The use of 5 per cent. phenol in oil eliminates the occasional unpleasant complications which marred to a slight extent the use of 20 per cent. phenol in glycerine solutions.

The method is one which requires special instruments and very special skill and experience, and I do not think it is one to be attempted by those who only have few opportunities for its employment. But I strongly recommend it to rectal surgeons who have been accustomed to use the older injection methods; I feel sure that, when once they have acquired the necessary technique and experience, they will adopt it exclusively. Apart from an occasional complicated case, where a preliminary divulsion is necessary, its use can entirely supersede operations of the old sort, with their attendant anæsthetics, confinement to bed, absence from work, pain and dread.

I cannot conclude this article without expressing my gratitude to Dr. Blanchard for giving me so much useful information and for details of his own technique and much invaluable advice.

WORKMEN'S CONTRIBUTIONS TO A HOSPITAL.—Contributions of a penny a week from workmen, amounting to £2500, formed more than half the total income of Workington Infirmary last year. After setting aside £1000 for investment, the institution was able to carry forward £682.

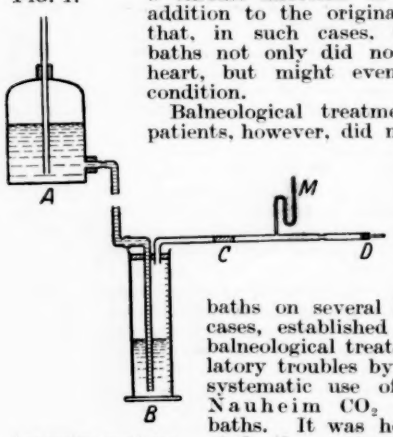
MENTAL DISORDER IN SCOTLAND.—At the annual meeting of the Royal Edinburgh Hospital for Mental and Nervous Disorders, Edinburgh (formerly the Royal Edinburgh Hospital for the Insane), Prof. G. M. Robertson, physician-superintendent, stated that nearly two-thirds of those who go for treatment do so voluntarily. The certified population of the hospital is diminishing, and he was satisfied that the day of the "certified lunatic" was drawing to a close in Scotland.

CARBON DIOXIDE THERMO-SALINE SPRINGS IN THE LIGHT OF MODERN RESEARCH.*

BY ADOLF SCHOTT, M.D.
(BAD NAUHEIM.)

IT would be carrying coals to Newcastle to emphasise here the importance of physiotherapy in the treatment of heart disease, Great Britain being the country where physical treatment for an affection of the heart was recommended for the first time. It was Stokes who, in the middle of the last century, advised exercise as a method of treatment for patients suffering from "fatty heart." Baths, however, of all kinds were even then strictly contra-indicated for any heart patient, until Beneke modified the general medical opinion. Beneke showed that the Nauheim baths, then used for the treatment of rheumatism, skin diseases, &c., could also be applied in those cases where the patients suffered from a chronic affection of the heart in addition to the original disease, and that, in such cases, the Nauheim baths not only did no harm to the heart, but might even improve its condition.

FIG. 1.



Apparatus used for injection of air.

Balneological treatment of heart patients, however, did not exist until August Schott, as the result of his observations on the effect of the natural Nauheim baths on several hundred heart cases, established in 1880 the balneological treatment of circulatory troubles by means of the systematic use of the natural Nauheim CO_2 thermo-saline baths. It was he who elaborated the system upon which these baths should be given, and who indicated the main points of their mode of action in heart cases. The following decades revealed, to a certain extent, the scientific basis for this then new and purely empirical method of treatment, and a great number of details as to the mode of action of these baths on the circulation were shown by the extensive clinical and research work of Th. Schott, Strasburger, Jacob, Müller and their various co-workers, Ernst Weber, Hediger, and many others in different countries.

As the result of this work, the tonic effect of the natural Nauheim CO_2 thermo-saline baths on circulation and respiration was demonstrated, as well as the superiority of the natural baths compared with artificial ones. The Nauheim baths forming a stimulus of the most complicated kind, influencing circulation and respiration from the skin, I decided to obtain a more intimate view from another point as to the mode of action of these baths by studying their effect on the subcutaneous CO_2 and O_2 tension, these tensions being dependent on the conditions of circulation and respiration. The study of the subcutaneous gas tensions seemed to be of still greater interest than blood gas examinations, as the investigation of subcutaneous gas tensions brings us a step nearer to the tissue cell itself.

The possibility of studying subcutaneous gas tensions easily and accurately has been given to us by the ingenious method of Campbell who showed that after the injection of N_2 or air into the subcutaneous tissue spaces, an equilibrium of tension is established between the injected gas and the tissues.

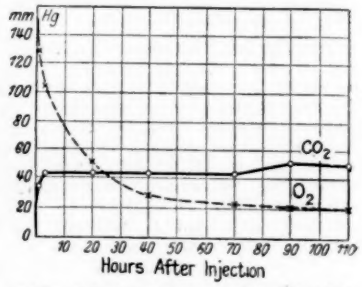
* Read before the Section of Balneology and Climatology of Royal Society of Medicine on Jan. 26th, 1928.

This equilibrium being attained the CO_2 and O_2 tensions remain approximately constant for a long time, so that ready means are afforded of studying the influence of exogenous factors on tissue CO_2 and O_2 tension.

Following, on the whole, the technique as elaborated by Campbell I developed a method of my own for injecting air into the subcutaneous tissue spaces. This enabled me to perform the injection steadily and without difficulty at any speed and pressure required. The simple technique is as follows (Fig. 1):

Water is run from a Mariotte flask (A) thereby displacing air from a graduated cylinder (B) through a filter of cotton-wool (C) into a rubber tube which leads to the injection needle (D), prepared according to Campbell's instructions so that there is a minimum of dead space on withdrawal of the gas samples from the subcutaneous tissue spaces afterwards. By observing the bubbles in the Mariotte flask, the manometer (M) connected with the rubber tube, and the level of the water in the cylinder, a steady injection of a known quantity of air under known pressure can easily be assured, the water flow being regulated by a screw clamp. Haldane's apparatus was used for analysing CO_2 and O_2 in the gas samples and the CO_2 and O_2 tensions calculated in the usual way.

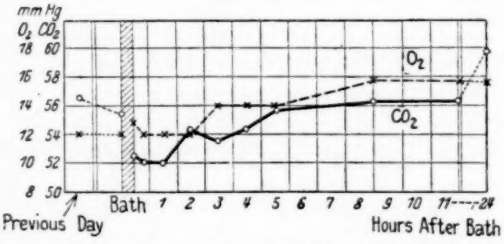
FIG. 2.



CO_2 and O_2 tension in gas under the skin (rabbit) for 110 hours, following the subcutaneous injection of atmospheric air.

After the injection of 750–1000 c.cm. of air into the subcutaneous tissue of unnarcotised rabbits it was necessary to wait until CO_2 and O_2 tensions became constant before beginning any experiment. I can fully confirm Campbell's statement that CO_2 equilibrium is established in about 1 hour, O_2 equilibrium, however, not before 1½–3 days after the injection. The final CO_2 and O_2 tensions proved to be in complete agreement with those found by Campbell, the CO_2 tension being 45-52 mm. Hg, the O_2 tension 20–26 mm. Hg in the majority of the experiments. The equilibrium once established, the long-continued constancy of the tensions in a particular animal is remarkable (Fig. 2).

FIG. 3.



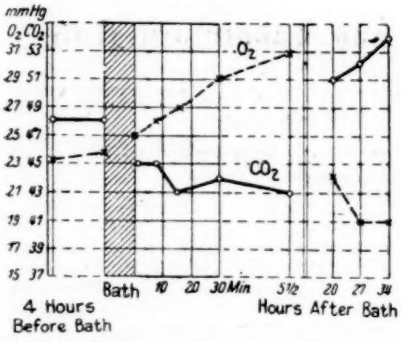
Standing effervescent Nauheim Sprudel bath of 82·4° F., and 30 minutes' duration. CO_2 and O_2 tension in gas under skin.

In order to obtain reliable results as to the effect of the Nauheim baths, care had to be taken that the animals did not inhale CO_2 which might escape from the bath, as inhalation of CO_2 produces hyperventilation, which leads to increased output of CO_2, and thereby influences the subcutaneous gas tensions. I therefore analysed the CO_2 content of the air 5 cm. above the surface of Nauheim standing effervescent and running effervescent baths, and confirmed the view that, in spite of the very large quantity of

CO_2 in the water, only very little escaped into the air, the CO_2 percentage being not more than 0·3 per cent.—this property being a characteristic of natural CO_2 baths. Above strongly running effervescent baths only, CO_2 was expelled mechanically, so that the air above the bath contained a relatively higher percentage of CO_2. Therefore, a ventilator was then used in all experiments, thus ensuring that the CO_2 content of the inhaled air did not exceed 0·1 per cent. in any experiment. The course of the experiment was the following: A rabbit was given an injection of 750–1000 c.cm. atmospheric air into the subcutaneous tissue spaces by the method described above. Four to five days later I satisfied myself that the CO_2 and O_2 tensions had become constant. This constancy was assured if the analyses of two samples of the gas under the skin taken at an interval of several (4–24) hours demonstrated the same values of the gas tensions. Then the animal was put into the bath, a further series of gas samples withdrawn from the gas under the skin at different intervals after the bath, so that a full record of the influence of the bath on the gas tensions was obtained.

The results of my investigations—10 experiments with 68 determinations of gas tensions—in which I used standing effervescent and running effervescent baths of the Nauheim spring VII, of 80–86° F. and 8–45 minutes' duration, are that a considerable fall of CO_2 tension in the gas under the skin was observed in all experiments. The decrease was 4–6 mm. Hg in the majority of the experiments, and ranged between 1 and 10 mm. Hg, the average being 5 mm. Hg. The minimum of CO_2 tension was usually observed ½–1 hour after the bath ended, the previous level being reached some hours later. On the following day the CO_2 tension very often proved to be above the previous level. The O_2 tension was increased in 50 per cent. of the experiments to 3·5 mm. Hg on an average, in the remaining 50 per cent. it was unaffected by the bath. The O_2 tension was observed to reach its maximum later than the minimum of the CO_2 tension. On the following day the O_2 tension either remained raised or fell to a lower level than before the bath (Figs. 3 and 4).

FIG. 4.



Running effervescent Nauheim (Sprudelstrom) bath of 82·4° F., and 10 minutes' duration. CO_2 and O_2 tension in gas under the skin.

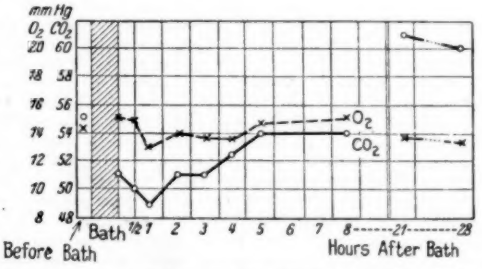
Plain water baths of the same temperature and duration proved to have the same effect on the CO_2 tension; they always caused, however, a fall also of the O_2 tension averaging 3 mm. Hg, whereas the Nauheim baths, as shown above, increased the O_2 tension or did not alter it (Fig. 5).

In order to interpret these results we have to consider, on the one hand, pharmacological research carried out by the same method; on the other hand, research on the Nauheim and other natural CO_2 thermo-saline baths by other methods. Realising that the subcutaneous CO_2 tension is about the same as the alveolar CO_2 tension and that both are influenced in the same way and to about the same extent by experimental interferences (Campbell, Campbell and Hill), it is easily understood that increased ventilation is an important factor in accounting for the diminution of the subcutaneous CO_2 tension as observed as a consequence of the Nauheim baths. This is analogous to the diminution of alveolar CO_2 tension by a great number of stimuli causing hyperventilation—e.g., baths, massage, &c. It has been proved repeatedly that baths lower alveolar CO_2 tension and, moreover, that cool, natural CO_2 baths lead to increased ventilation (Liljestrand and Magnus).

However, this interpretation is not sufficient to explain the increase or stability of the subcutaneous O_2 tension, Campbell having shown that hyperventilation produces a fall of both subcutaneous CO_2 and O_2 tensions. To understand these changes of O_2 tension the change of peripheral circulation has to be taken into consideration. We know that cardiac stimulants in corresponding doses produce changes in subcutaneous CO_2 and O_2 tensions in the same direction and to about the same extent as those observed in my experiments. A comparison between the influence on subcutaneous CO_2 and O_2 tensions of caffeine on the one hand, proved by Campbell, and a natural Nauheim effervescent bath on the other, illustrates the similarity in action of the two interferences.

As, moreover, vasoconstricting drugs (e.g., adrenalin and infundin) and temporary stopping of the circulation by histamine cause the reverse (i.e., an increase in CO_2 and a decrease in O_2 tension) (Campbell), we have every reason to interpret the results of this experimental study by assuming that the influence of the Nauheim baths on the peripheral circulation consists in the increase of the

FIG. 5.



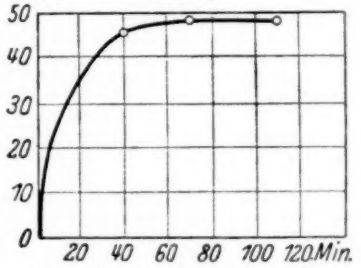
Plain water bath of 81° F., and 35 minutes' duration. CO_2 and O_2 tension in gas under the skin.

Table showing Comparison between the Effect on CO_2 and O_2 Tension in Gas under the Skin of the Subcutaneous Injection of 35 mg. Caffeine and an Effervescent Nauheim Bath. (See Fig. 6.)

35 mg. caffeine.*			Standing effervescent Nauheim Sprudel bath 82·4° F., 30 min.		
Time (min.).	CO_2 mm. Hg.	O_2 mm. Hg.	Time (min.).	CO_2 mm. Hg.	O_2 mm. Hg.
0	53	33	0	56	12
14	—	—	5	—	—
111	46	35	215	53	14

* Campbell, Jour. of Physiol., 1925, lx., 355.

FIG. 6.



Curve showing rise of pressure after injection of caffeine.

peripheral blood flow—the peripheral blood-vessels, capillaries, as well as the larger blood-vessels, being dilated.

This interpretation and conception is in perfect agreement with the results of other research work on the influence of natural Nauheim baths on circulation. Theodor Schott earlier made the same assumption on the ground of clinical observations and of blood-pressure determinations which showed a lowering of blood pressure in hypertension by Nauheim effervescent baths, even if below the point of indifference. This view is supported by the work of Strasburger and his co-workers, who showed an increase of the volume of the arm by plethysmographic examination and, by means of the mirror sphygmograph, a decrease of the velocity of the pulse-wave as effects of Nauheim effervescent baths on peripheral circulation. Hediger's new research work on the influence of natural CO_2 baths on pulse volume, carried out by his own method, leads to the same conclusion. He thereby confirmed the results, obtained by capillaroscopic investigation, which showed dilatation of the capillaries in cool CO_2 baths, and extended them to the assumption that also the deeper lying blood-vessels are dilated. This effect on the peripheral circulation was not shown by the plain water baths, which never increased the subcutaneous O_2 tension. The different effect on the subcutaneous O_2 tension produced by mineral water baths compared with plain water baths of the same temperature proves that in the action of mineral baths the temperature is not the only decisive factor, but that there is a specific effect of the CO_2 and also perhaps of the salts. Moreover, Campbell showed that changes in air temperature between 0° and 37° C. did not cause any appreciable change of the tension in the gas under the skin. When changes such as have been observed as a consequence of Nauheim baths were obtained by over-heating the animal with a carbon-arc lamp, the rectal temperature rose by 3° F., whereas cool natural mineral baths decrease the rectal temperature (Liljestrand and Magnus).

Still another point of more theoretical interest is elucidated by these researches. We have to realise that the CO_2 level of the subcutaneous tissues is lowered considerably by the baths used, and we have had to explain this fact by an increase in CO_2 output by increased ventilation. The results with regard to the subcutaneous CO_2 tension, therefore, clearly disprove the often-quoted opinion of Winternitz that the increase of CO_2 output in CO_2 baths, and the increase of the respiratory quotient to the value of more than unity, form an analytical proof of the resorption of CO_2 through the skin from the CO_2 bath. The results of my experiments, however, are in perfect agreement with the results of Liljestrand and Magnus's investigations in man, by which these authors showed that the rise of the respiratory quotient to the value of more than unity as a consequence of the CO_2 baths, is simply due to the washing out of the CO_2 of the body, thanks to the increase in ventilation caused by the bath. My investigations confirm the view that it is not possible to prove the resorption of CO_2 analytically, although clinical experience, as well as the vascular reaction characteristic of CO_2 baths, lead us to assume a local chemical action of resorbed CO_2 (Goldscheider). This opinion is compatible with the well-known fact that the skin plays a certain rôle in the excretion of CO_2. That the results of experiments on animals are applicable to human physiology only with a certain reserve need hardly be emphasised.

However this more theoretical point may be, these experiments are a new link in the chain of proofs that the Nauheim baths afford the possibility of giving a tonic treatment to heart patients by causing an alteration in peripheral circulation and by giving a tonic impulse to the heart. These investigations offer, therefore, a better understanding for the indications of the Nauheim treatment which have, of course, long been well known empirically, the chief indications being all those cases in which a tonic treatment of the circulation is needed; and also cases with genuine high blood pressure, for the reasons which follow from the points dealt with above. It would be beyond the scope of this paper to enter into the details of these indications.

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Clinical and Laboratory Notes.

AN ATTEMPT TO CONTROL AN EPIDEMIC OF MEASLES.

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THESE observations made during an epidemic of measles in one of the wards of the Hospital for Sick Children may be of interest in view of the absence of conclusive evidence of the ætiological relationship of the Tunnicliff "green" coccus to measles.

History of the Epidemic.

Nov. 15th, 1927: One patient, admitted on Nov. 11th, developed measles and was sent home. Another patient had developed what was thought to be rubella on Nov. 10th and died on Nov. 12th of pneumonia. On Nov. 22nd a patient who had been in the ward since Oct. 28th developed measles. On Nov. 23rd all the patients (26) were tested intradermally with a 1/250 dilution of a filtrate from a 48-hour growth of a subculture from the Tunnicliff "green" coccus. This subculture had been supplied by Dr. R. A. O'Brien. I had no evidence that the filtrate contained any toxin. These skin tests were read after 6, 10, and 24 hours, and were all negative. Six hours after these tests nine patients, with no previous history of measles, were given 10 c.cm. of (?) antitoxic serum intramuscularly. This serum was supplied by Dr. O'Brien, who stated that he had no evidence that it contained any antitoxin. A note, kindly supplied by him, on the preparation of this serum will be quoted later. Four patients with no previous history of measles went home before any serum was available. Three of these developed measles at home.

Of the nine patients who received this serum two developed measles six days after injection of serum; one developed measles three weeks after injection of serum; four did not develop measles in hospital and had not developed any catarrhal or other symptoms 16 days after discharge; one child could not be traced (no reply was received from the parents); one child was readmitted on Dec. 13th (20 days after receiving serum and 11 days after discharge) with broncho-pneumonia and laryngeal stridor, and died on the same day. There were no signs or history of measles. Post-mortem examination showed broncho-pneumonia only.

In addition a small supply of convalescents' measles serum was available from two patients only; it was not "pooled." This was given to three selected cases who were gravely ill and to whom an attack of measles would have been very dangerous.

1. Nov. 20th: 5 c.cm. of this serum were given to a case of convalescent pneumococcal septicæmia. This patient was discharged on Dec. 2nd, and had not developed measles by Dec. 20th.

2. A boy with marasmus, who developed catarrhal symptoms with Koplik's spots on Nov. 29th was given 5 c.cm. of convalescent serum. He died on Dec. 2nd. No rash had developed, and therefore the blanching power of the Tunnicliff goat antitoxin could not be observed.

3. A case of paratyphoid was given 5 c.cm. of human convalescent serum on Nov. 29th. She developed measles on Dec. 13th (14 days later).

Dr. O'Brien supplied a small quantity of antitoxin prepared from a goat by Dr. Ruth Tunnicliff of Chicago Intradermal tests with 0·1 c.cm. of this were carried out on four children during the catarrhal period preceding the development of the rash in order to observe the Debré blanching phenomenon. One patient died before any rash developed and three showed no blanching.

The superintendents of the fever hospitals, to which the three "protected" cases who developed measles were sent, did not consider that there was any definite modification of the course of the infection. All three were moderate, uncomplicated measles.

Summary.

When considering these results it should be remembered that there was no evidence of the toxicity of the filtrate used in skin testing. The "antitoxin" supplied by Dr. O'Brien was prepared from horses instead of goats, and he stated that he had no evidence that it contained any antitoxin.

(1) Twenty-six patients in one ward, aged from 1 month to 12 years, among whom cases of measles had occurred, were tested intradermally with filtrate from the Tunnicliff "green" coccus. Nine of these patients gave no previous history of measles. No positive skin reactions were obtained.

(2) Nine children with no history of measles were given "antitoxic" serum. Of these, three developed apparently unmodified measles six days and a fortnight later.

(3) Of four presumably susceptible children who were not given any serum, three developed measles at home.

(4) Three children were given convalescent serum. One child did not develop measles. One infant who was probably developing measles at the time of injection died three days later with no rash. The third child developed apparently unmodified measles a fortnight later.

(5) The Debré blanching reaction with Dr. Tunnicliff's antitoxin could not be obtained in three patients.

Dr. O'Brien has supplied the following note on the "green" coccus:—

"Dr. Ruth Tunnicliff very kindly sent me cultures of the 'green' coccus which she had found constantly present in the throats of patients suffering from measles and which she was inclined to think, from immunological evidence, was the cause of measles.

"Dr. C. C. Okell, working in London, found the organism present in all the swabs from several dozen cases of measles kindly supplied by Dr. F. M. Turner and other clinical friends. We therefore injected three horses for several months with increasing doses of culture filtrate, following in all details the technique successfully used for making scarlet fever antitoxin unconcentrated and concentrated. We had no means whatever of deciding whether the serum contained any antibody. It seemed that the only proof might come from giving the serum to half of groups of people recently exposed to infection and not having suffered previously from measles. Supplies of the serum were sent to 15 medical men who wished to try it. Inquiries have brought a certain small amount of information, which I am afraid is quite unconvincing. Some of the serum was used for treatment, and in some patients was considered by the clinician in charge to have had a definitely favourable effect. Most was used in attempts to prevent infection. Unfortunately, in most of the observations the serum was given to all contacts and not to half of those with no previous history of measles. It would take considerable space to give all the figures, but they do not to my mind convey any clear proof of protection. The few attempts that have been made to get a Debré blanching phenomenon and also a skin reaction have been unsatisfactory.

"I am greatly indebted to Miss Tunnicliff for keeping me in touch with her work. In a recent letter to me she has reviewed, with restraint, the evidence in favour of her organism and has suggested the use of living cultures for immunisation: unfortunately at the moment we cannot arrange for this.

"I must freely admit that the amount of evidence against the claim of the Tunnicliff coccus to be the cause of measles is very meagre: it is difficult to get satisfactory clinical observations carried out, but I feel bound to take this opportunity afforded by Dr. McClean of saying that, to my disappointment, our work has not supplied any clear evidence in favour of the 'green' coccus."

Conclusions.

These results do not suggest that the filtrate contained any toxin nor the serum any antitoxin. There was no evidence of any antitoxin in the goat serum when tested in three patients. The evidence of protection afforded by the serum of convalescents was not satisfactory in view of the small number of patients and the fact that the serum was not pooled.

These results, which are admittedly inconclusive, are presented in the hope that they will provoke the publication of the observations of other workers in the same field. It is important that the ætiological relationship of the Tunnicliff coccus to measles should be established or disproved as soon as possible. The evidence for the prophylactic and therapeutic value of serum from convalescents should be recorded in order that those public authorities through whose hands many measles cases pass may be induced to organise the supply of suitable serum for the use of practitioners and institutions.

My thanks are due to Dr. Robert Hutchison for permission to make these observations on patients under his care; to Dr. O'Brien of the Wellcome Research Laboratories for information and the supply of the materials used; to Dr. David Nabarro, the Director of the Department in which the work was done, and to Dr. C. F. Harris, the house physician, for help in reading the tests, administering the serum, and the collection of results.

A CASE OF SARCOSPORIDIOSIS.

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THE interest of this case lies in the rarity of human sarcosporidiosis and the identification of the species discovered. According to E. R. Stitt (1923) only three authentic cases have been reported. In one case they were found in the biceps, in another in the laryngeal muscles. According to H. B. Fantham (1916) six cases are on record.

A Hindu male of 55, without occupation, was admitted to the third surgeon's wards in the General Hospital, Madras, giving 15 days' history of an abscess of the left chest wall, which had started as a small pustule and gradually enlarged to about 2 inches in diameter. No previous illness. Wassermann reaction negative and urine normal. He was fairly well nourished and had no pyorrhœa. The edges of the ulcer were indurated, the base was fungating and adherent to the muscles, and presented sieve-like openings all over. The ulcer was provisionally diagnosed as "carbuncle chest" and excised under gas. The temperature remained normal all through the 29 days he was in hospital. The excised tissue was examined and reported on as sarcosporidiosis.

Macroscopic appearances.—Just over the nipple there is an irregular excavated ulcerous area roughly 1½ by 1 in., with undermined edges and irregularly globular projections from the sides and the base of the ulcer. The margins are thick, rounded, slightly inverted, dense, and sclerotic. On section the ulcer extends only to a portion of the subcutaneous fatty layer; the underlying areolar tissue is thickened and laminated. The pectoral muscles show pin-point white specks and fine lines.

Microscopic appearances.—Numerous sarcocyst tubes are seen invading the muscle-fibres. The cysts containing the sporozoites are not uniform in size or shape. Some are large and mature with well-developed septa, while others are immature. From the tissue received the entire length of the tube could not be discovered and dissected out. The average breadth of the mature cysts is 195 to 240 microns, and there are, on the average, 64 septa, which unite in the central area as a well-defined honeycomb-like structure. Between the septa the sporozoites are packed full, whereas in the central honeycomb-like area only a few can be seen. The younger ones appear nearly round, the mature ones oval or sausage-shaped. There is a definite hyaline, non-granular, non-laminated, non-striated cyst wall of 3·5 microns

thickness all round. This stains slightly pink with eosin. The muscle-fibrils are splayed out and overlap the cyst at the ends. Two cyst cavities present peculiar appearances. In one there is a ring of large, eosinophile, non-granular, mononuclear cells with abundant protoplasm all round, both on the inner and the outer side of the cyst wall; a few of these mononuclears are seen within the cyst cavity, amidst a certain quantity of granular débris and destroyed cyst septa. There are a few polymorphonuclears to be seen outside and inside, some in the actual process of migration into the cyst cavity. The other cyst cavity is packed full of the eosinophile non-granular mononuclears and a few polymorphonuclears. No sporozoites are visible, either inside or outside the cyst.

The average dimensions of the spores are: length, 9·7 to 12·7 microns; breadth, 2·9 to 4·4 microns. Each sporozoite is sickle-shaped, with one extremity sharp and thin, and the other somewhat rounded. The nucleus, which is oval with its long axis parallel to the length of the spore, is at a distance of one-fourth of the length of the sporozoite from the thin end. At the broader end a deeply chromatin-staining spot (Leishman stain) is visible. In every spore one or two (usually two) ruby-red, small chromatin granules are visible between the deep-stained spot at the broad end and the nucleus. The rest of the protoplasm stains a very light pink. The size of the nucleus is 3·6 by 2·0 microns. No spore wall can be made out. Some spores are plump, some lean, and others short, but the majority are of the same shape and size. The plump ones assume an elongated-lance shape.

I sent the preparations to the University of Edinburgh, and in June of last year they were examined by Prof. J. H. Ashworth, F.R.S., who stated that the parasite is septate and this, along with the general structure of the spore, indicates that it belongs to the genus sarcocystis. Many of the spores, he said, are almost straight. In some respects they resemble those of globidium. "The nucleus is near the broad end but in addition there is nearer the middle of the spore a deeply staining granule, and in some cases more than one."

I have to thank Capt. P. N. Basu, professor of pathology, Medical College, Madras, and Dr. G. V. James, the third surgeon, General Hospital, Madras, for permission to publish these notes.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF NEUROLOGY.

A MEETING of this Section was held on March 8th, with Dr. EDWIN BRAMWELL, the President, in the chair, when Dr. KINNIER WILSON opened a discussion on

NARCOLEPSY.

He said that the word had not occurred in the indices of *Brain* between 1899 and 1926, although the older literature contained numerous references to narcolepsy. The recent reawakening of interest might be one of the periodic waves so common in neurology, or might be due to a greater frequency of the condition during the past few years. He had been on the look-out for it for 20 years, but had never seen an adequate case of it till 1927, when he had seen four cases one after the other. Others had noticed the same sequence of events. Many of these cases, however, dated back for years, and could not be the result of the recent epidemic of encephalitis. In no circumstances could narcolepsy be regarded as a disease; it was a symptom or syndrome. Consideration of the disorders in which there was increase of sleep might throw light on those of absence of sleep. It was regrettable that people were rushing into print over the narcolepsies and often ignoring previous writings on the subject.

The first patient had had irresistible attacks of sleep for two and a half years, sometimes sleeping many times a day. In addition, he had had attacks, like those described by Gélineau and known as cataplexy, in which he sank to the ground or felt that he was going to do so. He had no organic nervous disorder and, like most of these cases, had attended hospital without improvement until tired of doing so.

The second case was that of a young man who had had cataplexy for 19 months, the first attack seizing him when he learned that he had won £5 in a football sweep. Since then he had had repeated attacks under the influence of —in many instances—quite trivial emotion. He had also developed typical sleep attacks, and if he tried to avert the onset of sleep a cataplectic attack would develop. Examined in one of these cataplexies, he had been found to be in a condition of massive atonia, with absent knee-jerks, an almost imperceptible flicker for a corneal reflex, and an extensor plantar response. In about two minutes he had said "I'm all right, sir," and had got up. When again tested, his plantar response had become flexor and his knee-jerks had returned.

The third patient was a man who had had symptoms since the end of the Boer war. In addition to sleep and cataplectic attacks he had had attacks of catalepsy or trance. When sitting quietly in a chair something would steal over him and he would suddenly find himself unable to move a single joint through the fraction of a millimetre. He would lie with closed eyes, to all appearances normal, and yet "someone could come in and murder him and he could not move." He had burned his fingers with the cigarette held between them.

The second case had also begun to develop cataplectic attacks of the nature of trance or catalepsy, and these had actually come on in his dreams. He had dreamed that he could not move or make a sound, and had then awakened, but continued to lie to all intents and purposes asleep; though aware of all that was going on, he was unable to move a finger.

Two Varieties of Narcolepsy.

If narcolepsy were regarded as a symptom, excitable in more than one direction, light would be thrown on phenomena lying on the borderline between the physiological and the psychical. It was useful to distinguish cases in which there were attacks of cataplexy and of short sleep from those in which there was prolonged sleep. Dr. Wilson has collected 45 cases of the first type from the literature of the last 40 years. The second group led into the region of the symptomatic narcolepsies—i.e., those associated with organic disease, particularly with tumours around the third ventricle. Righetti had collected 775 cases of cerebral tumour, of which 115 had shown pathological sleep; 34·7 per cent. of tumours of the thalamus and third ventricle, 27·9 per cent. around the medulla and pons, 26·5 per cent. of those in the vicinity of the hypophysis, and 25·6 per cent. about the corpora quadrigemina and pineal showed this symptom, whereas only 10 per cent. of cases of tumour of the central gyri had any unusual sleepiness. Half a dozen different ætiological factors might produce pathological sleep: epidemic encephalitis and trypanosomiasis were notorious instances. Dr. Wilson was most unwilling to separate all these as if they depended on different underlying mechanisms. He preferred to say that they all had some as yet unknown basis.

In many instances the patients had not, in fact, been "asleep" during attacks, as they had been aware of what had been going on around them, although unable to move and looking as if asleep. Moreover, there were all gradations between sleep and cataplexy. Emotion might precipitate either.

A larval case was that of a young man who found that if he looked at any object he became unable to turn his eyes away from it, and if he gazed fixedly at anything in a reverie he sank into a state of immobility. He had also an alternative form of cataplexy, feeling that he must fall to the ground, although he had never actually done so, under conditions of very slight psychological stress.

Cataplexy, Narcolepsy, and Epilepsy.

The sufferer from myoplegia or periodic family paralysis took hours to develop the flaccid palsy and loss of reflexes, while the cataplectic took seconds, but the condition was the same when developed. The resemblances between narcolepsy and epilepsy were greater than the differences, and the two might be a

pair of Jackson's "corresponding opposites." The patient in an epileptic attack was unconscious and his limbs were in motion; in a cataplectic attack he was awake and immobile, the consciousness of the cortex fully active, with absolute outfall of tone and motility at low level. Resemblances included the recurrence, the short attack, the sudden onset, and the interference with consciousness. Epilepsy and narcolepsy had been recorded in the same patient in a number of cases.

A patient of Dr. Wilson's, a man of 21, had had nine or more epileptic fits between the ages of 2 and 14, at which age they had ceased. Recently, however, he had found that uproarious laughter would bring on cataplectic attacks in which he lost himself, turned white, fell, or sat still unable to move.

It was very undesirable to differentiate epilepsy and narcolepsy as if they were fundamentally distinct, and a prima facie case could be made out for their resemblance. They might have analogous physiological mechanisms. If many of the sleep cases were really trance-like states, cataplexy, immobility with awareness, then the phenomena were phenomena of inhibition, and the sensory stimuli in these cases were inhibitory instead of excitatory. Quite a large part of the phenomena of ordinary epilepsy was inhibitory. The patient with petit mal became immobile, dropped what was in his hand, stared. In the aura he might become blind or deaf. In the narcolepsies the same condition was carried further, and practically all the phenomena were phenomena of inhibition. Pavlov had shown that sleep was pure cortical inhibition descending to the mid-brain. If it did not so descend, the animal was not asleep, but in a state of catalepsy, fixed, and staring, with flexibilitas cerea. The catalepsy resembled what was seen in many cases of narcolepsy. Occasionally, Jacksonian epilepsy, after a sensory aura, might take the form of loss of power instead of twitching. Complete atonia was seen after the "knock-out" on the point. It would be interesting to know if the knocked-out pugilist lost his knee-jerks.

Discussion.

Dr. C. C. WORSTER-DROUGHT said that he had four cases of narcolepsy under observation and could confirm Dr. Wilson's observations. He had been looking out for cases for years, but had only seen them within the last 18 months. In his patients the sleep attacks had preceded the cataplectic attacks by two years or so. He had induced a cataplexy in one case by telling a funny story and had noted the extreme atonia and absence of arm- and knee-jerks. He regarded narcolepsy as a form of some symptom-complex indicative of an underlying cerebral disturbance. A case of syringomyelia had fallen asleep without provocation; he had had no definite cataplexies, but stated that when he laughed heartily he felt as if he were doubling up. There was a very narrow borderline between cataplexy and narcolepsy.

Sir JAMES PURVES-STEWART pointed out that in normal sleep one of the most important and constant phenomena was atonia, which was quite sufficient to account for the loss of knee-jerks. If the third ventricle were inflated with air from above, the patient at once fell into happy, peaceful sleep. If it were inflated from below, filling the subarachnoid space at the same time, there might be considerable meningeal reaction with headache. The paroxysmal character of narcolepsy had not yet been explained, and no static lesion could explain it. That was a crucial point.

Dr. WILFRED HARRIS said that it was not the sudden blow to the sensorium which produced the "knock-out"; it was the sudden violent jerking back of the head on the neck. From the technical point of view nothing was stationary, perhaps; but static lesions, in the ordinary sense of the word, could produce paroxysmal phenomena—for instance, trigeminal neuralgia.

Dr. GRAINGER STEWART had seen two or three cases of narcolepsy in the last two years, and described a case in a child with epilepsy. The child's eyes drooped, and she sank down on the table on lifting the spoon or fork with the first mouthful of a meal. He had come to the conclusion that the attacks, originally taken for petit mal, were really cataplectic.

Dr. P. C. P. CLOAKE read a letter from a patient describing vividly her narcoleptic attacks. She was in a state of mental confusion after the attacks, which appeared to be a mixture of sleep and cataplexy. As a normal individual dropped to sleep, associations became freer and freer and less connected by logical bonds. It was impossible to think of a wave of inhibition passing over the cortex, except in the sense that there was a sudden cessation of evolution of neural or psychic energy. Extensor plantar reflexes had been obtained during sleep.

Dr. H. COHEN had seen eight cases of so-called narcolepsy in recent years, three of them sequelæ of epidemic encephalitis. One patient's attacks had been precipitated by a sudden start of any kind, particularly a noise. There was an epileptic family history. Another patient, who had a spastic paraplegia dating from infancy, fell into a cataplexy on any loud noise and for 30 or 40 seconds was conscious but unable to speak, showing typical mild clonic movements. In a third case noise produced typical epilepsy. He had seen the same gradation, though not so extreme, with uproarious laughter. These cases showed some definite relationship between epilepsy and so-called narcolepsy.

Dr. GORDON HOLMES related several cases of narcolepsy. One was that of a boy who had been subject to epistaxis, which ceased when the narcolepsy began. The second suffered from cataplectic attacks brought on by annoyance. A third patient, a clergyman and schoolmaster, had suffered from headaches and attacks of falling and of irresistible sleep. He had small scotomata in each upper right and left quadrants, indicating an organic lesion. Curiously enough, his attacks had become less frequent after a course of thyroid, and had now disappeared. Dr. Holmes disputed Dr. Wilson's statement that the word sleep should not be applied to people who were conscious to some degree of what was happening around them. This was a stage of normal sleep.

Dr. R. D. GILLESPIE described a patient who had cataplectic attacks provoked by slight emotion, but not by serious frights. Another case had done well on hyoscine hydrobromide. He had observed a man in an attack two years ago and had found knee-jerks and plantar response absent and a slight ptosis of one eyelid with immobility of the pupil. Another patient was subject to attacks after a hot bath, but found that splashing cold water in his face enabled him to avoid them.

ROYAL INSTITUTE OF PUBLIC HEALTH.

PROBLEMS IN MEDICO-LEGAL PRACTICE.

ON March 7th Mr. Justice HUMPHREYS took the chair at a meeting of this Institute, when Dr. ROCHE LYNCH began a lecture on this subject by discussing

Criminal Abortion.

This was, he said, practised to a greater extent to-day than ever before, and thus presented one of the most pressing problems of forensic medicine. Quoting the relevant statute, he pointed out that it was the intention which constituted the crime; it was not necessary for an abortion to take place and, except where a woman procured her own miscarriage, it was equally a crime whether she were pregnant or not. Moreover, the statute did not in fact make any exception for abortion procured by doctors for medical reasons. Certain doctors seemed recently to have altered their opinions and to practise the operation in cases which, according to the older views, amounted almost if not quite to an illegal operation. When a doctor was called in to a case of attempted abortion he was faced with a very difficult problem of conduct. The Royal College of Physicians of London had

examined the question very carefully in 1916 and had published rules which stated :—

1. That a moral obligation rests upon every medical practitioner to respect the confidence of his patient and that without her consent he is not justified in disclosing information obtained in the course of his professional attendance on her.

2. That every medical practitioner who is convinced that criminal abortion has been practised on his patient should urge her, especially when she is likely to die, to make a statement which may be taken as evidence against a person who has performed the operation, provided always that her chances of recovery are not thereby prejudiced.

3. That in the event of her refusal to make such a statement he is under no legal obligation to take further action, but he should continue to attend the patient to the best of his ability.

4. That before taking any action which may lead to legal proceedings a medical practitioner will be wise to obtain the best medical and legal advice available, both to ensure that the patient's statement may have value as legal evidence, and to safeguard his own interests, since in the present state of the law there is no certainty that he will be protected against subsequent litigation.

5. That if the patient should die he should refuse to give a certificate of the cause of death and should communicate with the coroner.

The College had been advised : (*a*) that a medical practitioner was under no legal obligation either to urge the patient to make a statement or, if she refused to do so, to take any further action ; (*b*) that when a patient who was dangerously ill consented to give evidence her statement might be taken as a dying declaration or statutory deposition.

Dr. Lynch then referred to Sir William Willcox's letter in THE LANCET of Jan. 9th, 1915, expressing the opinion that where there was conclusive objective evidence of criminal interference the duty undoubtedly rested with the medical practitioner to inform the legal authorities ; his duty to the public in such a case overrode any obligation of professional secrecy. A learned judge had stated that no jury would convict a doctor if proceedings were subsequently taken against him for betraying confidence. On the other hand, the doctor would be put to great expense and inconvenience in obtaining that verdict. When abortion was properly performed the mortality was almost nil, but the methods used by the criminal abortionist were never those used by medical men, and an important reason for the rigorous prosecution of the abortionist was his danger to society.

Drugs Used as Abortifacients.

The varieties and combinations of harmless drugs sold for this purpose were legion. The vendor traded on the ignorance of unfortunate women, and in the lecturer's submission the sale of these substances was fraudulent. A girl had spent her life savings—about £40—on a treatment supplied to " dissolve the contents of the womb." The pills consisted of caffeine, iron salts, starch, garlic, and some herbs, of which the main ingredients were cloves and sage. The capsules contained urotropin, and the suppositories cocoa butter and zinc oxide. Not only was the treatment quite innocuous, but its cost was only a few pence.

Harmful drugs included aloes, quinine, ergot, pituitrin, strong purgatives, and some essential oils. Some caused painful contractions of the large intestine which spread sympathetically to the uterine musculature ; others caused pelvic congestion or irritation of the urinary tract. Ergot and quinine alone had any direct action on the uterus. The drugs were usually supplied in small doses, which made it very difficult for the medical witness to give positive evidence on whether they were harmful or not. Many of them could be bought without question, and it was no business of the chemist's to ask what they were wanted for. Even if drugs to cure amenorrhœa were asked for the chemist often forgot his duty to refer the customer to a doctor. Herbalists and less reputable establishments sold these drugs in large quantities at enhanced prices. The only regrettable feature about the recent case of Rex *v.* Bacon and Bolton was that it had been impossible to bring into the charge newspapers which had published advertisements of the business. If advertisements of this kind could be stopped, much of the trade would be suppressed. Poisonous substances had from time to time been used for abortion, including arsenic, mercury, phosphorus, and lead. In this case the abortion was rather a complication of the acute serious illness caused by the poison than a result of the drug taken. The popularity of diachylon plaster as an abortifacient had greatly diminished since it had been placed in Part I. of the schedule. In the majority of cases abortion would not occur even after large doses of the drugs sold, yet undoubtedly they did succeed in certain cases. The successful cases did not attain publicity, but it was not credible that the preparations were entirely useless, seeing the great amounts of them which were sold.

What is a " Noxious " Drug ?

From a medical point of view a noxious thing was one which would cause illness, permanent injury, or death. There had been so many legal pronouncements on the meaning of the word that the result was confusing. Two opinions threw light on it.

Archbold said : " It is not sufficient that the defendant merely imagined that the thing administered would have the effect intended, but it must also appear that the substance administered was either a poison or a noxious thing.

2. " Where a substance is not a ' poison,' then, although if when administered in small quantities it may be innocuous and useful, yet if the quantity administered by the defendant is noxious, the quantity of the substance so administered by him is a ' noxious thing ' within the statute. On the other hand, if the substance when administered in large quantities is noxious yet if, in the quantity administered by the defendant, it is innocuous, he is not guilty of the administration of a ' noxious thing ' within the statute.

3. " Whether it were, in fact, a substance likely or calculated to produce that effect seems to be immaterial, provided the intent be proved, and the substance were a poison or other noxious thing."

Mr. Justice Darling had held that where the inciter knew that the drug was not, in fact, noxious or capable of procuring abortion, but knew that the woman would take it in the belief that it would have that effect, the inciter was not guilty of an offence, but the woman was guilty of attempting to commit abortion. He had further held that if the stuff were harmless the accused could be properly indicted for obtaining money by false pretences, and that, if further advertisements of the preparation appeared, the newspaper authorities would find themselves in the dock. Nevertheless, when all was said, the question of " noxiousness " was for the jury to decide, and their decision would rest largely on the evidence given by the expert medical witness.

The Select Committee on patent medicines had reported in 1914 that " the existing law is chaotic and has proved inoperative, and successful prosecution for fraud in the advertisement and sale of secret remedies is fraught with the greatest difficulty."

Mechanical Abortion.

Any foreign solution injected into the uterus would cause it to expel its contents ; soapy water was most commonly used. Frequent syringing of the vagina with hot liquids might produce abortion, probably through solution of the mucous plug in the cervical canal. The varieties of sharp rigid instruments used for the purpose were legion. An occasional complication to their use was death from shock, immediate or delayed. Probably fear of the unknown, secrecy and the knowledge that the act was illegal all played their part in producing it. The electrical method consisted in applying a pad soaked in salt solution to the cervix and another to the abdomen. When an electric current was passed between them the uterus often contracted. This type of crime was most difficult to detect, and probably impossible in the absence of a burn or mechanical damage. In many cases drug treatment was combined with mechanical treatment. The limitation of these practices must depend largely on the medical profession. A prosecution seldom took place unless a medical man had been called in. The doctor might look to the lawyer to make representa-

tions for an amendment of the law so as to allow more stringent control.

Blood Groupings, Blood Stains, and Paternity.

Dr. Lynch then described how the four blood groupings might be used to test the claim of a prisoner that the blood on his clothes came from a cut made whilst shaving and not from his alleged victim. The test would work definitely on a blood stain a year or so old. The examination of agglutinable property in the corpuscle and agglutinin in the serum provided a double test, and would be as valuable to prove the innocence of the innocent as the guilt of the guilty. Another application of blood groups was in the determination of paternity. They followed strict Mendelian laws, and two parents of Group IV. could have only children of Group IV. If a mother belonged to Group II. and her baby to Group IV. a man of Group III. could not possibly be the father.

The Distinction between Abortion and Birth Control.

Mr. Justice HUMPHREYS pointed out the grave increase in the practice of criminal abortion in this country. It was most important to bear in mind that birth control and criminal abortion were two totally different things. The one was highly criminal; the other might be desirable or undesirable, but it was not criminal. It was the greatest possible mistake for those who wanted to impress on a woman the danger and wrongfulness of abortion to add that it was equally wrong to try to avoid having children. Many women felt that having children or not was entirely a personal matter, and if they thought their medical or legal adviser wrong about one thing they were very apt to think him wrong about the other. Mr. Justice Humphreys doubted whether he had any sympathy for the woman who tried to procure a criminal abortion and failed to get the stuff she wanted. He had never advised the prosecution for false pretences of persons who were deceiving those who ought to be deceived. What must be put down was the sale of drugs that the purveyors knew would in all probability be used to procure abortion. In the case of Rex *v.* Bacon and Bolton the defendants had not, he was happy to say, been successful in avoiding criminal responsibility because the dose they had recommended was more probable than not to fail. He saw no difficulty about the meaning of the word "noxious." All that the medical witness had to remember was that the question of intention was perfectly immaterial. A thing did not become harmful because someone wished it to be harmful. Was the drug one that was likely to procure abortion? was the only question he had to consider. If he replied that in many women that drug in that dose would procure abortion but in a great many other women it would not, then he might leave it to the judge to direct the jury as to whether the drug was noxious or not. One judge, at least, in such a case, would say that there was ample evidence upon which they could find that it was so noxious.

MEDICAL SOCIETY OF LONDON.

A MEETING of this Society was held on March 12th, Mr. H. W. CARSON, the President, in the chair. A paper on the

CARRIER PROBLEM

was read by Dr. J. E. MCCARTNEY, who said that human carriers of infection were important from the point of view of the bacteriologist, the sanitarian, the epidemiologist, and the physician. Their economic aspect also was of considerable importance, though it did not seem to be often considered. In a large Metropolitan Asylums Board institution there were always some 40 or 50 diphtheria carriers, each of which cost about £4 per week. Among diseases which human carriers transmitted were typhoid fever, dysentery, diphtheria, meningococcal infections, scarlet fever, pneumonia, cholera, undulant fever, poliomyelitis, sexual diseases, measles, mumps, chicken-pox, and perhaps influenza. Tropical disease he did not propose to deal with. A carrier, said Dr. McCartney, was an individual who harboured and transmitted pathogenic organisms without showing the usual evidence of infection. Signs of infection could be found in carriers if they were sought for, but they were not the usual signs. The first type of carrier was the convalescent, chiefly found in diphtheria and typhoid fever. All who suffered from disease were carriers in the sense that they could transmit infection; but they were not true carriers, because they showed the usual evidence of it. A convalescing patient, however, though clinically well, might still harbour the organisms. If such a patient harboured the germs of disease for only a short time he was known as a temporary convalescent carrier, and was not very important. If he harboured them for a longer period—arbitrarily given as 12 weeks in the case of diphtheria—he was described as a chronic carrier. The other type was the "contact" carrier, who acquired the organisms from a sick person or from another carrier, and did not manifest the disease. Later, the resistance of such a person might break down, so that the disease became evident in him. If so he would come into the category of "incubationary" carriers. Many people had disease in a mild and unrecognised form, and sometimes there might be four links in the chain of infection, the fifth person alone being obviously ill, which made it difficult to trace the course of an epidemic.

Diphtheria.

At present, said Dr. McCartney, the carrier disease of greatest practical significance was diphtheria. In this, the chronic convalescent carrier was very important; chronic contact cases did occur, but they were not so common. To estimate the virulence of diphtheria organisms it was necessary to test them by intercutaneous inoculation into the guinea-pig. People who harboured non-virulent diphtheria bacilli could not, in Dr. McCartney's opinion, cause fresh cases of diphtheria—a statement which was based on a large number of observations. Non-virulent diphtheria did not tend to become virulent, and the recognition of these non-virulent cases had liberated from institutional seclusion hundreds of persons. But it was necessary to carry out the test very thoroughly. Text-books stated that cultures from the throat should be examined 12 to 18 hours after being taken, because at a later stage the bacilli were apt to be overgrown and the chances of getting a positive result were diminished. The truth was that in the case of carriers the organisms were not actually growing in the throat, and they only began to grow rapidly about seven hours after being put into a tube of broth, this interval before growth being called the "lag" period. For testing carriers the culture must be left for 48 hours, the number of positive results being 50 per cent. greater at this time than it was after 24 hours. When organisms from a chronic carrier got into the throat they might be eliminated by the defence mechanisms of the body before they had had time to excrete enough toxin to exert their pathogenic effect and overcome the natural resistance of the body. The intermittency of carriers must be borne in mind, for it was clear that a few negative results did not prove that a carrier was cured. Cases might be negative for weeks and then suddenly become positive. At the North-Eastern Fever Hospital six consecutive negatives were required, extending over a period of six weeks, before a patient with diphtheria was discharged. Whether or not a patient would become a carrier could not be decided from the clinical course of the disease, but the mild cases seemed the more likely to become carriers, especially between the ages of 1 and 5, or to a lesser extent, 5 and 10 years.

The organism in the chronic carrier did not exist on the actual living tissue of the host, but on the product of the inflammatory reaction caused by other organisms. The usual site of the organisms in throat carriers of diphtheria was the tonsils or adenoids, but the most persistent carrier and the one most

difficult to deal with was that in which the bacilli were in the nose, where they seemed to thrive on the products of chronic rhinitis associated with deflected septum and abnormal turbinates. In a series of 95 carriers, 72 had been found to have some nasal affection. Every case with virulent bacilli had to be dealt with according to its particular characters. In a throat case, removal of adenoids and tonsils would cure, but in a nasal case the proposition was very different. Homologous vaccines would clear up probably 30 per cent. of the nasal carriers, since eradication of the organisms causing the inflammation on which the diphtheria bacilli lived might lead to a cure. A mild alkaline douche was useful for clearing up a purulent discharge.

Typhoid and other Carriers.

It had been shown, Dr. McCartney continued, that about 4–5 per cent. of typhoid and paratyphoid patients were likely to become carriers, and some American writers put the proportion much higher. The chronic carriers conveyed the disease by means of their fæcal and urinary discharges and by chronic abscesses and chronic inflammation of bone. Fæcal carriers represented 93 per cent. of all the cases. The bacilli usually resided in the gall-bladder and many of the patients had gall-stones. In examining the typhoid carrier an attempt should be made to get the contents of the small intestine, and this was helped by giving a calomel purge. Women constituted the bulk of typhoid carriers; there were but few cases in children. Outbreaks of the disease in mental hospitals always left a serious carrier problem, owing to the dirty habits of the patients, and typhoid and dysentery were ever-present troubles in asylums. In the search for carriers the Widal reaction was of little use. Treatment of typhoid carriers was unsatisfactory. Removal of the gall-bladder might cure the condition, but was it justified? For urinary carriers, urinary antiseptics might be tried, but in all these carrier cases the best course was to secure the willing coöperation of the person concerned, especially as regards promiscuous urination and strict cleanliness. The public health regulations were most unsatisfactory, as they did not give full power to deal with carriers unless they were actually engaged in handling food.

Bacillary dysentery was not important from the present standpoint. Many people who had never been out of this country might be harbouring the *Amœba histolytica*. Very few convalescents from meningococcal infections became carriers, and contact carriers rarely developed the disease. The organisms were located in the upper respiratory tract, and probably did not live in the tissues, but on the products of inflammatory reaction. 300 cases of scarlet fever had been examined at the main laboratory of the M.A.B. on their discharge at the end of seven weeks, and half had been found to be carrying the hæmolytic streptococci which caused scarlet fever; but in the summer months, when there were comparatively few such cases in the wards, the proportion fell to 7 per cent. In a full hospital patients were constantly being reinfected. The carrier stage of scarlet fever he regarded as only a short one. No return cases of scarlet fever had been received.

Dr. JOHN FREEMAN said he would extend the term "carrier" to cover many other common ailments of a microbic nature. Whilst phthisis was generally included amongst diseases spread by carriers, he thought gonorrhœa shouldbe placed in the same category. A woman with chronic gonorrhœa might show no clinical signs of the disease, but might nevertheless communicate it in an acute form by sexual intercourse. Again, a man with very septic gums might transfer the trouble to another; whilst streptococcal migration to other persons might cause a variety of far-from-negligible troubles, such as tonsillitis, laryngitis, sinusitis, impetigo, and, secondarily, rheumatism, asthma, anæmia, toxæmia. One of the things that might embarrass those who gave prophylactic catarrhal vaccine was the lighting-up of some septic focus which previously had not been obvious. All people were carriers more or less, and the bulk of disease was spread in this way.

Discussion.

Sir JOHN BROADBENT said he had hoped to hear how to cure carriers of diphtheria, scarlet fever, and meningococcal diseases, but it must be admitted that not much advance had been made in those respects. Carriers were much more numerous and virulent in times of epidemic than at other times. Scarlet fever carriers presented a very difficult problem. In 90 per cent. of cases admitted to hospital there was no history of infection, and it was difficult to know how the disease had been acquired; had the patients come into contact with cases which had not been diagnosed? Scarlet fever could be conveyed a long time after desquamation ceased, and when a case went out of hospital it was impossible to be sure it would not be a carrier. He did not know how to deal with meningococcal carriers.

Mr. ZACHARY COPE thought that it was justifiable to remove the gall-bladder of people who were spreading typhoid owing to its infection; especially as, in most of those cases, gall-stones were present. He agreed that the method of intubation practised by Vincent Lyon could first be tried.

Dr. P. R. DODWELL spoke of the success in some schools under the London County Council of a campaign of active immunisation among the children.

Dr. V. S. HODSON referred to the elaborate measures that were taken to lessen the incidence of diseases in the days before microbes were causally connected with them. Many of these precautions had since been relaxed and attention was so much concentrated on bacilli that useful means of prevention were apt to be neglected.

Dr. ANTHONY FEILING asked whether there was any effective medical treatment of a typhoid carrier who rapidly manufactured gall-stones. In one case a man of 23 took hexamine grs. 100 three times a day and developed a second attack of acute cholecystitis.—Dr. HOPE CARLTON spoke of the relationship of scarlet fever and burns in children.—Dr. WARREN CROWE asked for the proofs that scarlet fever was due to a streptococcus.

Dr. MCCARTNEY replied. The parasite and the host, he said, must always be considered together. Also the size of the dose was very important; very few people could withstand any disease if the dose was sufficiently massive. Whenever beds were close together there was always the danger of persistent reinfection. In typhoid carriers removal of the gall-bladder did not necessarily remove infection. He considered that there was ample evidence that scarlet fever was due to a streptococcus.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society on March 1st Dr. DONALD HALL, the President, in the chair, a lecture on the Rôle of

Radium in Treatment of Cancer of the Breast and Tongue

was given by Mr. DUNCAN FITZWILLIAMS. One of the changes of the present day, he said, was the replacement of surgery by the use of radium in areas where it could be applied. In the tongue, radium had largely replaced the knife among surgeons who understood its use. Among the methods of applying radium was the insertion of seeds of glass containing radium emanations. These seeds were planted into the tissues and left there; the radium emanations diminished gradually and the glass capsule remained. A drawback to this method was that if it was used in a septic cavity such as the mouth, sepsis might supervene, so that the capsule could not be found in the œdematous tissue. A better method consisted

of the insertion of metal containers with a piece of fine silk attached to them so that they could be withdrawn after a certain time; an instrument after the manner of a trocar and cannula had been devised for the introduction of these seeds. This method of using radium was rather new, and it was too soon to say whether it would hold its own, but superficial growths disappeared as if by magic when treated in this way. Alternatively, needles containing radium could be employed. They were of varying lengths and were made of platinum 0·5 mm. thick, so as to screen off injurious rays from the tissues. They should contain 0·2 to 0·5 mg. of radium, and the most useful length, he thought, was one of two inches. The needles should be left in place for a week or ten days. Yet another method was to use tubes containing about 50 mg. of radium, heavily screened. These tubes were useful in some cases of carcinoma of the cervix. It was an inefficient method of treating cancer to place large doses in the centre of the growth where the cells were degenerating and harmless; it was much better to surround the growth with radium needles so as to deal with the actively growing edge. The last method of using radium was by tubes or plaques, either of the metal itself or emanations, which were placed upon the skin. He had never obtained good results from this method in large growths, but it was a very good way of dealing with small superficial growths, such as rodent ulcers and epitheliomata of the lips.

In considering cancer of the breast, Mr. Fitzwilliams pointed out that only extrathoracic carcinoma could be treated effectively. If the cancer cells had already gained the interior of the chest, the patient would probably die of internal metastases, however widely the original growth was removed. In primary carcinoma of the breast the knife was far superior to radium in the early stages. Only in atrophic cases, in those which were unsuitable for operations and in encephaloid cases, was radium to be recommended. The main rôle of radium was to deal with the external metastases, and these could be treated with the certainty of cure.

In the tongue, said Mr. Fitzwilliams in conclusion, the disease was superficially local, but penetrated very deeply; failure to realise this depth of penetration was the cause of local recurrence after operation. Seeds or needles would cause the growth in the tongue to disappear, but left a very suspicious hardness behind. For the glands in the neck block-dissection, combined with the use of radium, was the best form of treatment. He strongly recommended the use of lead in combination with radium.

DONATIONS AND BEQUESTS.—Among other bequests the late Mr. Charles Ward, J.P., of Blackpool and Oldham, left £1000 to the Oldham Royal Infirmary for the endowment of a bed.—Mrs. Harriett Mansfield, Bristol, left £500 each to the Bristol General Hospital and the Bristol Royal Infirmary, and £1000 to Muller's Orphanage, Ashley Down.—Mrs. Amelia Pickup, of the Towers, Hightown, Liverpool, besides other bequests left £1000 to the Blackburn Infirmary for a "James Pickup Cot," and £100 to the Liverpool Maternity Hospital.—Lady Hudson has made a donation of £3000 to Westminster Hospital for the perpetual endowment of a ward in memory of the late Sir Robert Arundell Hudson, treasurer of the hospital from 1921 until 1927.—Mr. William Irving Armstrong, of Hexham, Northumberland, left £1000 each to the Monkwearmouth and Southwick Hospital, the Sunderland Royal Hospital, and the Hexham Memorial Hospital.—Miss Cecilia Brough, of Ardmere, Dundee, left £2000 to the Dundee Royal Infirmary, and £1000 each to the Royal Victoria Hospital, Dundee, and the Royal Dundee Institution for the Blind—each subject to certain life interests.—Under the will of the late Colonel Henry Doughty, formerly a shipowner of Hartlepool and Harrogate, an initial distribution of £100,000, part of the residual estate, has been made to 20 charitable and philanthropic institutions, and the two hospitals and the Hospital Trust Fund at the Hartlepools receive £5000 each; British Legion, £10,000; King Edward's Hospital Fund, £8000; the Port of Hull Orphanage, £6000; Dr. Barnardo's Homes, £5000.—Mr. Arthur Smith Graham, of Great Ambrook, Totnes, Devon, left £40,000 for charities, and of this sum St. Dunstan's Hostel for Blinded Sailors and Soldiers will receive one-fourth part.

Reviews and Notices of Books.

THE ABDOMINAL SURGERY OF CHILDREN.

By L. E. BARRINGTON-WARD, Ch.M., F.R.C.S., Surgeon, Hospital for Sick Children, Great Ormond-street; Senior Surgeon, Royal Northern Hospital. London: Humphrey Milford, Oxford University Press. 1928. Pp. 283. 15*s*.

CHILDREN as surgical patients present special problems of their own, and the general surgeon will be glad to have the advice of a specialist in this branch put at his disposal in attractive form. The chapter on general principles is especially good, and while certain of the recommendations for treatment may not receive unanimous endorsement, this does not mean that the author has not reasons for his views. But sometimes more exact guidance is needed. What the reader looks for, and particularly the operating surgeon, in a monograph by a specialist is precise directions to assist him in the technical difficulties he meets. For example, how best to separate the very thin sac of a congenital hernia, by what method to replace an imperfectly descended testicle into the abdomen, how to perform an enterostomy for ileus and when to close it. The lack of detailed information is partly redressed by the good bibliography at the end of each chapter, but many readers would have welcomed a little digest of the teachings and experiences. Everybody will not agree with the author that the pampiniform plexus should be divided or the testicle of a child removed when it cannot be brought down into the scrotum; nor does it seem good advice to say that the size of the incision in acute appendicitis does not matter. It also makes for clearer and more accurate work to search for the collapsed rather than to follow along the distended coils in acute intestinal obstruction. While this much may be said by way of caution to the reader, there is ample evidence throughout the book of the author's large experience and close observation. For example, such useful information as why it is wrong to aspirate a hydrocele, and how abdominal puncture may be used for the diagnosis of pneumococcal peritonitis, is summarised valuably. The book is a creditable addition to an excellent series of monographs of reasonable size from the Oxford University Press, and may be confidently recommended.

FRACTURES IN GENERAL PRACTICE.

Traitement des Fractures par le Praticien. By Dr. ETIENNE, Professeur agrégé chargé du Cours de Pathologie externe à la Faculté de Médecine de Montpellier. Paris: Masson et Cie. 1927. Pp. 194. Fr.16.

THE same causes are at work in France as in England to increase the number and gravity of cases of fracture, and as Dr. Jeanbrau says in a preface to Dr. Etienne's little book, at any moment the general practitioner may find himself urgently called upon to treat such injuries. In particular this book is intended for the country doctor, who has to decide upon and apply immediate treatment, without radiographs, special apparatus, or skilled assistance, relying upon his own wits and manual skill. In such a small work it is manifestly impossible to attempt to do more than describe typical injuries and their typical treatment, and this we think Dr. Etienne has done in a manner worthy of the historic school once adorned by Rabelais.

He gives as general indications of treatment the following three rules: first, keep the patient alive by combating serious complications, such as pneumonia, damage to soft parts, or urinary infection; secondly, restore the functions of the injured limb; and, lastly, make sure of firm union. Dr. Etienne is not an advocate of immediate reduction in all cases, at all costs, but he prefers in some cases, such as

fractures of the lower end of the humerus, to proceed gradually, and even to wait several days before completing reduction. As he says nothing of anæsthetics in this connexion, it may be that this is in some sort a counsel of necessity and not of choice. The method of treating fractures of the leg and ankle, which is known in France as that of Delbet, deserves the attention which Dr. Jeanbrau calls to it in the preface. This method combines weight extension in the first 48 hours while the plaster is setting, with ambulant treatment on crutches after the first three days. The details of the application of the plaster and of the extension and of the instruction of the patient in walking are clearly described. Hardly enough stress is laid upon the importance of complete reduction and replacement of the foot in its normal position in cases of Pott's fracture—here as usual with French writers, called Dupuytren's. Without the help of X rays, however, it will be a matter of doubt and difficulty for the surgeon to assure himself and his patient that the reduction is complete and the prospect of full restoration of function sure. Moreover, unless great attention is given to detail and the instructions very closely followed we fear that the practitioner, inexperienced in such treatment, may find that the ambulant method leads to disaster as regards function.

The 144 outline drawings with which the book is illustrated are clear and helpful, and the methods of treatment recommended are as up to date as the presumed circumstances would allow.

HEART AND ATHLETICS.

By Dr. FELIX DEUTSCH, Privatdocent in Internal Medicine at the University of Vienna; and Dr. EMIL KAUF, Assistant at the "Heart Station" in Vienna. English translation by LOUIS M. WARFIELD, A.B., M.D. London: Henry Kimpton. 1927. Pp. 187. 10*s*. 6*d*.

THAT athletics are responsible for the production of certain forms of heart disease is one of those widely prevalent ideas which are based on general impressions rather than on accumulated facts. When one comes to inquire into the foundation of those impressions it is surprising to find how scanty are the accurate observations on the subject in the English and American literature, and this alone is sufficient to justify Dr. Warfield's translation of the work by Drs. Deutsch and Kauf. The authors have had at their disposal a plentiful supply of material, a supply which, as regards swimmers at any rate, must be almost unique, since the Austrian Swimming Society made it obligatory for all of its members to be examined at the "Heart Station" in Vienna. Attention has been concentrated chiefly on the question of cardiac enlargement, and this fact leads one to make two criticisms of the methods employed. In the first place, is the transverse diameter of the cardiac shadow an adequate index of cardiac enlargement? And secondly, are there not other definitely measurable phenomena which may signify impairment of the cardiac function even in the absence of enlargement?

The material is divided into two main groups: (1) those who take exercise for pleasure, and (2) those who go in for competitive athletics. In the first group there is no evidence that athletics produce cardiac enlargement over and above that which might be expected to be associated with the general improvement in physique. Even in the second group the majority of the individuals studied have hearts of normal size, but in a certain percentage there is definite evidence of abnormal cardiac development. This percentage varies for different types of sport, being highest in rowing. Ski-ing, cycling, swimming, and wrestling come next; it is surprising that running comes low down on the list. The authors consider that emotional factors play an important part in determining cardiac enlargement, but the evidence they produce in support of this opinion is inadequate. An interesting chapter is devoted to the variation in size of the heart, recorded in particular cases, during the course of training, and to the criteria employed for deciding whether training should be allowed to proceed. Though many of the observations on which this book is based are of undoubted importance, some of the deductions from them fail to carry conviction. More evidence on the subject should be collected from various countries.

CHEMOTHERAPY AND SYPHILIS.

Principles and Practice of Chemotherapy. With special reference to the Specific and General Treatment of Syphilis. By JOHN A. KOLMER, M.D., Dr.P.H., D.Sc. (Hon.), Professor of Pathology and Bacteriology in the Graduate School of Medicine of the University of Pennsylvania; Member of the Research Institute for Cutaneous Medicine. London and Philadelphia: W. B. Saunders Company. Pp. 1106. 55*s*.

THIS monograph is based on Prof. Kolmer's book entitled "Infection, Immunity, and Specific Therapy," which he has enlarged and rewritten.

The author begins with a section on the principles of chemotherapy and traces its history back to the discovery of mercury as an antisyphilitic agent in about the year 1500. He then discusses at some length the chemotherapy of various types of disease before passing to the consideration of syphilis; the pharmacology and toxicology of antisyphilitic medicaments and the methods of their administration are dealt with in great, even too great, detail. For example, in the single section, where the technique is described for venous puncture, intramuscular and subcutaneous injections, spinal, cistern, and ventricular puncture and injection, there are some 40 illustrations, many of which are very similar one to another and quite redundant.

More than half the volume is taken up with experimental work on rabbits and guinea-pigs, inoculated with syphilis or other protozoan diseases in relationship to chemotherapy. Various drugs, well and less well known have been employed, and an enormous amount of painstaking work has obviously been done. Experimental work with silver arsphenamin showed a great variation in the spirocheticidal power of various batches of the preparation, but seemed to give a higher therapeutic index than arsphenamin. Arsphenamins of copper, gold, and platinum were found to be more powerfully bactericidal than arsphenamin, but less than silver salvarsan. Prof. Kolmer believes that in syphilis after each injection of salvarsan or neosalvarsan, spirochætes are destroyed 24 to 48 hours after injection "by the therapeutically active oxidation or reduction products, followed by the development of some immunity principles engendered by the antigenic substances released from the destroyed spirochætes. According to his theory these immune substances at least aid in holding the activity of spirochætes in check or latency, if they are not actually destructive for them. He shows experimentally that by giving subcurative doses of salvarsan and neosalvarsan, spirochætes can be rendered resistant to these substances, both in vivo and in vitro. This has been known for some time by syphilologists in active practice and gives the basis of therapy by repeated large-sized doses of salvarsan. Dr. Kolmer found mercury compounds to be much less spirochæticidal than the organic arsenic products. As regards bismuth administration, he holds that the toxicity depends not only on the percentage of bismuth in a preparation, but also on the speed with which it is absorbed. French observers have been emphatic as to the dangers of the intravenous administration of bismuth. Dr. Kolmer gives, as complications after intravenous bismuth, dyspnœa, cough, and thoracic oppression. Jarisch-Herxheimer reactions are dealt with fully, and the grave risk of starting to treat tertiary lesions with large doses of salvarsan or neosalvarsan is noted.

The author's treatment of primary and secondary syphilis is much more intensive than is usual in this country, since he gives, to begin with, three *daily*

successive doses of 0·6 g. of a 914 preparation followed by six more injections of 0·9 g. at the rate of two a week. His treatment of later syphilis is more in accordance with European methods, and his comments on the importance of regarding the old syphilitic case, with persistently positive Wassermann, as an imperfectly cured case, and therefore a potential menace to himself and the offspring, will give satisfaction to the practical syphilologist. Part of his antenatal treatment of a woman with a positive Wassermann reaction, to ensure a healthy fœtus, would not meet with approval in this country, since Dr. Kolmer is an advocate for inunction of mercury thrice weekly, for at least a month, preferably longer. This mode of treatment is, in our opinion, unnecessarily tiresome compared with any result gained; but the author's other recommendations as to intravenous injections of 614 and intramuscular injections of bismuth during pregnancy are in accordance with European methods. There is no reference, anywhere in this book, to the use of sulphur as a preventive of toxæmia—either in the form of contramine or of sodium thiosulphate. The use of a glucose drink before the administration of arsenical derivatives is evidently not in vogue in America. An undue amount of space is occupied with descriptions of alternative methods of administration of mercury and iodides.

The book is a strange combination of a review of experimental laboratory methods with a manual of clinical instruction suited to those who have not even an elementary knowledge of the modern technique in syphilis. The author has included all the recommended drugs and methods of treatment, including non-specific protein therapy and malarial inoculation, and his bibliography is enormous. But it is difficult to see for what class of medical practitioner the book has been written.

FORECASTING EPIDEMICS.

Climate and Disease Incidence in India: Forecasting Epidemics. Being the twenty-ninth Robert Boyle Lecture. By Sir LEONARD ROGERS, C.I.E., M.D., F.R.C.P., F.R.C.S., F.R.S. London: Humphrey Milford, Oxford University Press. 1927. Pp. 39. 1*s.*

THIS little booklet embodies the Robert Boyle lecture for 1927 which threw light, from the special angle of the author's experience in India, on the vexed subject of the epidemic constitution. The varied climate of India presents unique opportunities for studying the effect of meteorological factors on different diseases. The lecturer found that leprosy, rainfall, and humidity declined steadily from east to west up the Gangetic valley, whilst the unfavourable effect of rain-bearing winds on tuberculosis was amply confirmed. Small-pox showed a marked decline during the south-west monsoon, but the essential factor seemed to be the absolute humidity of the atmosphere. The same factor plays a large part, Sir Leonard Rogers considers, in the incidence of cholera, and he points out that, although variations in the weather are outside the sphere of preventive medicine, much can be done by concentrating sanitary armies at the points of danger if these can be forecast. All who are concerned with epidemiology or with the prevention of disease in India will find much to interest them in the lecture.

TUBERCULOSIS.

Contributions to the Study of Tuberculosis. By Research Department, National Jewish Hospital at Denver. Vol. VII.

THIS volume reflects credit on the director and his colleagues. The report contains a mass of material, divided into three sections. The introductory section is chiefly biographical and consists of addresses given on well-known pioneers of medicine. The second section is devoted entirely to laboratory research. The third deals with clinical contributions, such as the surgery of pulmonary tuberculosis, tuberculin, accidental pneumothorax, the treatment of bronchial asthma, and essays on diet. The research section gives a number of original communications reprinted from the *American Review of Tuberculosis*, on the variability of the localisation of tuberculosis in the organs of different animals; several papers on tissue reactions to *B. tuberculosis*, and also some work on the cytomorphology of the tubercle bacillus. The work on the variability of localisation of tuberculous lesions in various animals is of particular interest. Here it is shown that the extent of the distribution of tubercle bacilli to the various organs is alone insufficient to explain the lesions. In addition to the ability of the cells of the histological tubercle to destroy the bacillus, changes in oxygen tension in tuberculous foci are shown to be sufficient to change a quiescent focus into progressive disease.

IMMORTALITY.

By I. HARRIS, M.D. London: Williams and Norgate, Ltd. 1927. Pp. 68. 2*s.* 6*d.*

THIS book deals with man's place in the universe and the meaning and goal of existence, and its number of pages indicates the fragmentary character to which the author confesses in the preface. But his attempt to describe a momentary glance or fleeting impression of a realm difficult to conceive is a brave one. Assuming that the opinion is gaining ground that the different elements are compounds of one really elementary body, and that at the basis of all diversity there is unity, he regards existence as a uniform thing, our phenomenal world being the realisation of different states of matter, while death, or complete dormancy, is the condition where the phenomenal world is non-existent, all diversity being swallowed up in uniformity. On the subjects of individuality and the universe as a self-creating and self-regulating entity he finds that individual life can be accounted for only by universal life and momentary existence by eternal existence. A chapter on religion is an endeavour to find a creed in harmony with modern progress, and the riddle of immortality is left unsolved in a final chapter.

PROHIBITION.

Its Economic and Industrial Aspects. By HERMAN FELDMAN, Ph.D., Assistant Professor of Industrial Relations, Dartmouth College. London and New York: D. Appleton and Co. 1928. Pp. 415. 7*s.* 6*d.*

IT is as difficult for anyone in this country to get a sure idea of the effects of prohibition in the United States as it is to find out exactly what has happened in Russia; most commentaries on both situations are confessedly biased one way or the other, and any which seem objective and neutral in outlook are naturally suspect. But Dr. Feldman says that his account is no more than a summary of the most exact facts which he has been able to ascertain, and a reading of his book fails to suggest any other attitude on his part. It is then prima facie worth attention. He limits himself to the economic and industrial aspects of the Volstead Act, and moral, political, and social questions are left on one side. Prohibition meant at the first a considerable loss in property to the brewing and distilling trade, some loss to farmers who grew barley and hops, and an unimportant loss in taxation. These were temporary. Taking a longer view, he finds that employers are overwhelmingly favourable to prohibition as it affects production and business. The money formerly spent on drink now goes to other things, and there is a general agreement that the standard of living of the worker is much higher. There is no doubt that Dr. Feldman thinks that the balance works out strongly in favour of prohibition. But he is uneasy about the future. Prohibition has certainly not stopped drinking, and probably never will stop it entirely, and since 1920 the statistics for alcoholic deaths, alcoholic destitution, and arrests for drunkenness have all shown an upward direction.

MEMORIAL FUND TO SIR DAWSON WILLIAMS.

THE following is a list of the first subscribers to the Memorial Fund in honour of Sir Dawson Williams. It was rightly decided that the movement for a testimonial, which was started in the week before his death, should continue, and that the resulting Fund should be employed in the institution of a memorial to him connected in some intimate and apt manner with the advancement of medicine. The Fund remains open for a time in order that answers to the appeal may be awaited from medical men resident abroad.

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KING'S COLLEGE HOSPITAL.—It was reported at the annual court of governors that a ward set free by the removal of the Massage School to a neighbouring house is being used as a substitute for any ward that is being cleaned and renovated. It is hoped presently to erect two, or perhaps three wards for paying patients. The number of treatments given in the Physical Treatment Department has increased from 40,000 in 1921 to over 81,000 in 1927.

CHILDREN'S HOSPITALS.—The King and Queen have consented to perform the opening ceremony in May next of the new Princess Louise Kensington Hospital for Children. Their Majesties have, however, made it a condition that the building shall by then be free of debt. The amount still needed is £9250, but £1000 has been promised by the King's Fund, and £500 from another source, both conditionally upon the full amount being raised.—The annual report of Birmingham Children's Hospital shows that last year the total number of children admitted was 5274, nearly 1000 more than in 1926; the average daily number of inmates was 145. To relieve the growing pressure upon the hospital it is proposed to add two wards of about 40 more beds at a cost of £10,000. A speech defects clinic was begun in July last, and the private ward continued to be a successful adjunct.

THE LANCET.

LONDON: SATURDAY, MARCH 17, 1928.

PAINLESS CHILDBIRTH.

THE due provision of anæsthesia during labour is not so simple as it appears at first sight, or to those who have not considered the problem as it affects the motherhood of the nation as a whole. On one aspect only of the subject was complete unanimity displayed during the discussion recently held at the Royal Society of Medicine.[1] That unanimity was expressed regarding the desirability of using anæsthetics for confinement cases. It was pointed out, with undoubted truth, that it would be a national advantage for women to be rid of the traditional fear of the pains of childbirth, and for them to know that the process might be made at least as painless as any ordinary surgical operation. Too many women are deterred from motherhood, or their safety is threatened, by that fear of pain which, as Dr. EARDLEY HOLLAND pointed out, is instilled into their minds from childhood upwards by words in the Book of Common Prayer, if not from other sources also. A new tradition of painless labour should be propagated. And it must be founded on fact. It is not enough to show that a confinement can always be freed from any grave amount of pain. It must actually be made free. Of objections to the use of anæsthetics during labour those based on religious grounds are now happily regarded as dead and buried. Later opposition has depended on the belief that the anæsthetics delayed labour, or were injurious to the mother or the child, or to both. The truth is that, properly employed, anæsthetics need never delay and can actually expedite the child-bearing process. For there is a stage of that process when the patient may do all she can to retard the oncoming head owing to the agony of pain which its advance is causing. Analgesia or anæsthesia at this time will, as was pointed out at the discussion, lead actually to a diminution of the time spent on giving birth to the child. Though it is true that all anæsthetics have experimentally been shown to have the power to delay the contractions of the uterus, there is much difference between their use in order to demonstrate this fact in the laboratory and their skilful clinical employment. When properly used anæsthetics can abolish pain at a normal confinement without delaying progress. This proper use implies a method by which a state of analgesia, rather than anæsthesia, is kept up intermittently throughout the greater part of the time. Between the "pains" the patient slumbers, at the "pains" she inhales anæsthetic enough to keep her free from pain, and this state is pushed to true surgical anæsthesia only at the critical part of the expulsive stage, or at the accoucheur's request.

There is more than one way of obtaining this desired state of analgesia and anæsthesia. It seems to be admitted widely that the ideal is reached by the skilled employment of nitrous oxide and oxygen, but most ideals are difficult of attainment, and this is no exception. In fact, it may be said with truth that the use of nitrous oxide and oxygen for confinements is impracticable in the vast majority of cases. Certainly it can be employed in institutions, nursing homes and hospitals, and in private houses if special arrangements can be made, but there must be a narrow bed and there must be cumbersome apparatus. Given these and a skilled anæsthetist prepared to devote unlimited time to the case, then a normal confinement can be conducted so as to save all pain and so as to leave the patient less disturbed by the process than is possible in any other circumstances. Nitrous oxide is, of course, a non-toxic anæsthetic; the metabolism of mother and child is entirely unaffected, and the uterine contractions of labour are neither delayed nor diminished. The same advantages cannot, all of them, be claimed for the anæsthetic most commonly employed for confinements in Great Britain—namely, chloroform. Notwithstanding its defects, however, most of the speakers at the discussion to which we have referred were prepared to defend and advocate its employment. This may at first sight seem strange when we remember the almost general condemnation of chloroform as a routine anæsthetic for operations nowadays. Nevertheless the apparent contradiction is fully justified. The proper use of chloroform in midwifery is very different from its use for surgical operations. The conditions are different and the object aimed at is different. To begin with, there is in the woman in labour an entire absence of that psychic danger which arises from fear of taking the anæsthetic. The woman in labour, so far from being afraid of an anæsthetic, is crying out for one. This rules out in her case that formidable and not entirely explicable risk which is involved in the induction of anæsthesia by chloroform in a patient who is fearful of it. Again, the drug is used during labour, when it is used expertly, in such a way that a condition of little more than analgesia is produced during the attacks of pain. It is entirely withheld in the intervals, and surgical anæsthesia is produced, if at all, only when the head is passing over the perineum. The accumulated evidence of years supports the contention that in skilled hands chloroform can be more safely used in confinements than in general surgery. When abnormal labours or obstetric operations are concerned most anæsthetists, we believe, prefer ether, and assist the case on ordinary surgical lines. The use of twilight sleep as the chief means of avoiding pain does not appear to have many supporters, but a modified use of sedative drugs—chloral, omnopon, morphia, and scopolamine—early in labour is evidently favoured by those best qualified to speak, and is practised in conjunction with anæsthetics. What is known as "synergistic anæsthesia" has not been widely employed in this country. It often involves several intramuscular injections as well as a rectal injection. On a priori grounds the rectum would not usually be selected as a convenient introductory route in the pregnant woman, and it does in fact appear that sometimes there is difficulty in getting the catheter past the fœtal head. Moreover, the patient not infrequently expels the rectal injection. (This was indeed alluded to by one sarcastic speaker as the sole recommendation of the method.) These disadvantages would have to be ignored, of course, if the method were shown to have the great superiority claimed by its American originators, but from their own country there has lately come a well-supported review[2] of "synergistic anæsthesia" which is by no means encouraging. It is here stated that

[1] See THE LANCET, March 10th, p. 498.

[2] Jour. Amer. Med. Assoc., Dec. 17th, 26th, 31st, 1927.

"GWATHMEY and his associates have attempted to develop a method of anæsthesia without an adequate experimental basis; hence they have fallen into errors which could have been avoided, and GWATHMEY has based theories on erroneous views which have been accepted and repeated by other writers." Strong arguments are adduced against the actual occurrence of the synergism described as resulting from the coöperation of morphia and magnesium sulphate and ether in the technique recommended by GWATHMEY, while it is admitted that "the action of morphine on the respiratory centre is synergistic with that of ether and magnesium sulphate and that numerous deaths have resulted from their combined use."

Whatever be the method of anæsthesia decided on as most generally desirable in obstetrics, the great practical problem in this country still remains unsolved. That problem is how to bring this desired anæsthesia within reach of the great majority of child-bearing women. At the present time a large majority of the children born in England are born under the ægis not of a medical man but of a certified midwife. The midwife has no authority to use, and no training in the use of, anæsthetic drugs in the second stage of labour, although under the rules of the Central Midwives Board she is at liberty to administer sedatives such as morphia, chloral and bromide in the first stage and has received appropriate instruction. Should this arrangement be extended so that these women are trained in some specified safe, simple anæsthetic administration? If that expedient is not resorted to, in what way is the medical profession to answer the demand which it is making—that every child-bearing mother should be relieved of her pain at labour? The problem is a thorny one. There are members of the profession who believe that the use of anæsthetics is already not sufficiently safeguarded, and who would like to see a special diploma instituted to mark out the man who has special skill and knowledge in this department of practice. The mere idea of a midwife using anæsthetics at all would obviously be anathema to those who think thus. We can make no pretence to offering a solution of the problem of supplying adequate anæsthesia for obstetrics in the country at large; but the recognition that a problem exists is the first step towards its solution, and we hope that the questions involved will receive serious attention. They merit it.

LEGAL COMPULSION IN VENEREAL DISEASE TREATMENT.

A RECENT account of venereal disease legislation in Germany touches significantly upon the problem which the Edinburgh Corporation Bill has brought into prominence. Writing on the new German law in the *World's Health* for March, Dr. ROESCHMANN, of Berlin, naturally dwells upon the familiar fact that many patients, either from ignorance or callousness, neglect their treatment before they are completely cured, and thus become liable to dangerous relapses which make them a constant peril to others. On this account, he says, the national insurance institutes in Germany organised in 1916 antivenereal observation stations which exercised a sort of supervision by summoning patients to report until completely cured. The system was voluntary; if the patient ignored the summons, he could not be compelled. The new German law preserves the voluntary principle as far as possible, but reinforces it with compulsion. In future if a patient breaks off his visits, his doctor will first ask him to resume treatment. On refusal the doctor will report the case either to the observation station or to the health authorities, which in their turn will summon him to resume the course. These two summonses will contain no threat; it is only when the patient refuses to comply with the summons of the health authorities that coercive measures will be taken, involving compulsory treatment and (if necessary) detention in hospital. The change in the law is that the health authorities can enforce compulsion which was not—and still is not—within the competence of the observation stations. Treatment involving serious risk may not be prescribed without the patient's consent. He may choose his own doctor, and the doctor may choose his own method of treatment; treatment of this class of disease is confined to doctors qualified to practise in Germany. The new law abandons compulsion in respect of the police regulation of prostitution, but it allows the competent health authority to require a person suspected of spreading infection to present a medical certificate or to submit to medical examination in an approved hospital. Doctors, as Dr. ROESCHMANN observes, have always tried to obtain voluntary evidence of the source of a new infection and to persuade the person responsible to submit to treatment. In the event of refusal there was, however, no other legal remedy than the cumbrous invocation of Articles 223–4 and 230–1 of the Penal Code which provided penalties for the infliction of bodily injury with or without malice aforethought. This latter step was rarely taken because the persons concerned shunned publicity and because the medical profession was bound by its rule of secrecy. Henceforth, says Dr. ROESCHMANN, doctors are free to report sources of infection to the health authorities in Germany, since the employees of the health service are themselves bound to keep professional secrets. Further, he adds, the notification of a case to the health authorities involves no inconvenience to the patient; it is only when the patient refuses to submit to treatment that coercion begins.

These extracts deal with but one aspect of the new law passed in 1927 by the Reichstag and depending in part upon detailed regulations with which the several States of the German Republic have subsequently supplemented the Reich law. The extracts have been selected for their bearing upon the Edinburgh Bill controversy. In that controversy all parties have really but a single purpose—to stamp out venereal disease at the earliest possible moment. Their only difference is as to method. The Bill, say its opponents, relies upon compulsion when the full possibilities of the voluntary system have not yet been exhausted. The general medical practitioner, they say, is not always competent to use modern technique for the detection and treatment of syphilis and gonorrhœa; the Bill will lead to the giving of medical certificates of freedom from infection which will not always be trustworthy. There is a threat, say the opponents of the Bill, to the professional tradition of secrecy, a danger of abuse of the denunciation of suspected persons. Compulsory notification, they continue, might be largely ignored by private practitioners, so that the only persons penalised would be those attending venereal disease centres. The effect of the Bill, they contend, would be to deter the infected person from reporting for treatment or to induce him to give a false name and address to even a greater extent than such persons do already. These arguments are undeniably weighty; it is for

Parliament to say if they overweigh the considerations urged in favour of the Edinburgh experiment. There are plenty of examples of the process by which a progressive movement in public health, tentatively initiated by a local authority, has afterwards been adopted by the Local Government Board or its successor the Ministry of Health. The standard of public health legislation throughout the country is raised by broadening the application of new principles which have been found successful locally.

The first question is whether the voluntary system can eradicate venereal disease in a reasonable period. If the answer is in the affirmative, there is no other question. If it is in the negative and if the voluntary principle is to be reinforced, it is difficult to see what better safeguards can be devised than those in the Edinburgh Bill. Those conditions seem to have been attained in which the Trevethin Committee was prepared to advocate experimental local legislation. Australia has tried compulsion with results which baffle observers at a distance. Edinburgh offers to make the experiment nearer home; her public health record is known and her medical staff is trusted. Parliament has to say whether the experiment shall or shall not be made.

THE PREVALENCE OF RESPIRATORY DISEASES.

ALTHOUGH cancer is the cause of death which attracts most public attention and its proportional share of the gross mortality is large, 11·7 per cent. in 1926, the toll taken by the non-tuberculous diseases of the respiratory system—of which pneumonia and bronchitis are far the most important—is much greater. In 1926 15 per cent. of all deaths were due to diseases of the respiratory system (exclusive of tuberculosis). In his annual report for 1925, Sir GEORGE NEWMAN devoted special attention to the problem of the respiratory diseases. Reviewing the evidence suggesting that some part of this mortality was preventable he wrote as follows:—

"We cannot *prove* in a logical and convincing way that climate, or the pollution of the atmosphere with smoke, dust and other ingredients, are directly murderous, but we know by experience that their presence is inimical to all forms of life, just as we know that sunlight and fresh clean air are favourable to vitality and resistance to infection. Every form of industrial or mechanical contrivance which either prevents or reduces pollution of the atmosphere is a contribution to the public health, and this aspect of the problem calls for the continued and vigilant attention both of authorities and those responsible for commercial concerns. But this is not all. There is needed an increase in the knowledge and practice of healthy living. Much can be done by personal prudence, by cleanliness, by exercise, by correct breathing, by domestic ventilation, and by the practice of individual hygiene."

In this issue we print an interesting study of the data from the statistical point of view by Miss H. M. WOODS, of the London School of Hygiene and Tropical Medicine. In an earlier paper Miss WOODS gave reasons for thinking that the pneumonia of childhood is more sensitive to environmental conditions than that of later ages. Thus she found that the net, or partial, correlation between the death-rate under five from pneumonia and the percentage of the population overcrowded (the data were the statistics of the London boroughs, 1921–23) when the death-rates from pneumonia at ages 45–64 and 65–74 were held constant, was large and positive. On the other hand, the pneumonia death-rate of middle life was only moderately, and that of old age not at all, correlated with the measure of unsatisfactory housing. Her present paper deals with the subject in a more general way, and her account of the statistical difficulties in the way of evaluating the precise influence of such factors as temperature and air pollution upon the rate of mortality will be welcomed by those who have, perhaps, felt some impatience with the hesitancy of statisticians in pronouncing judgment. The evidence collated by Miss WOODS, who rightly gives prominence to the observations of Prof. E. L. COLLIS, plainly strengthens the case from which Dr. STEVENSON and Sir GEORGE NEWMAN have inferred that a large element of the mortality from respiratory diseases is indeed preventable, just as it confirms the view that there is no *one* noxious factor the elimination of which would be effective. Miss WOODS has displayed a reticence, not always observed by students of public health problems who are not members of the medical profession, in discussing the purely medical aspects of the subject. But medical readers will surely endorse the implication of her last paragraph and its relevant quotation from the Chief Medical Officer of the Ministry of Health's report for 1923: "The time has come when the whole question of using isolation hospitals to greater advantage calls for the consideration of local authorities, and it may well be that fuller regard should be paid to patients suffering from respiratory disease." It is to be feared that many victims of pneumonia are not at present receiving that skilled nursing and attention which are the beginning and end of successful treatment.

Annotations.

"Ne quid nimis."

ASTHMA RESEARCH COUNCIL.

FEW problems in medicine present a more fascinating study than that of asthma. During an attack the patient often appears to be in extremis and his sufferings are pitiful to watch; yet shortly afterwards he is in perfect condition and he may even be a successful athlete between his attacks. On seeking a cause we are struck by the variety of conditions which may give rise to an attack. One subject may suffer only at the week-ends, another only at certain seasons of the year. Climate affects some asthmatics but has no effect on others. Some are at their best in a bad London fog. Dust plays an important part, and so sometimes do the emanations from certain animals. Particular articles of food will invariably bring on an attack with some victims, while with others diet seems to make no difference at all. There is a strong neurotic element in many cases and several members of one family may be asthmatics. With such a variety of exciting causes it is obvious that to find any treatment, the basis of which is to remove the cause, will be a matter of considerable complexity, and no one can wonder at the large number of so-called cures on the market. Further, difficult as it is to prevent a recurrence of the asthma, it is usually a simple matter to relieve the symptoms during an attack and the majority of quack medicines aim solely at relieving the bronchial spasm. Amongst the many peculiarities of asthma are the diseases with which it is often associated. A patient may suffer from severe eczema and asthma alternately, another may have epilepsy, urticaria, angio-neurotic œdema, or some other affection, but they usually come separately, so that whilst suffering from eczema he is free from asthma. Sufferers, as a rule, are free from

attacks during pregnancy or during an acute illness, such as enteric fever.

In order to study these problems certain sufferers from asthma have formed an Asthma Research Council and have appointed a Medical Advisory Committee. The Council are anxious for help, especially from sufferers, and an appeal has been sent to the medical press in the hope that doctors may get the support of their asthmatic patients. There can be little doubt that research into these problems will be of substantial value. The personal experiences of a large number of individual asthmatics should provide a wealth of material from which much information may be obtained. Organised research is the only way of investigating the numerous problems presented by asthma and its allied conditions. The Asthma Research Council, in their appeal, suggest a number of lines along which the investigation may proceed, and the phenomena of sensitisation and desensitisation are of special interest. It has been observed that shock of any kind will desensitise some asthmatics for a time and shock therapy has a recognised place in the treatment of asthma. Shock may be induced by an intravenous injection of any foreign protein, and peptone is frequently used, but shock resulting from an accident, such as a broken leg, frequently renders the patient free from asthma for some time. Desensitisation, in the strict sense of destroying the patient's sensitiveness to some specific substance, is also a matter for careful consideration. It is not known to what degree an immunising substance acts by virtue of being a foreign protein. Tuberculin has been used in the treatment of asthma and good results have been observed in some cases. This gave rise to a belief that tuberculosis was in some way connected with asthma, whereas in all probability the tuberculin acted simply as a non-specific protein—it may be noted that similar results have been obtained by injecting milk. In short, so many methods of treating asthma have been described that no one principle of treatment is recognised, while new "cures" are constantly being advocated. The Asthma Council proposes to investigate the value of these various "cures" and to try to find some scientific basis for building up a rational form of treatment.

The relationship between asthma and certain allied conditions, such as hay-fever and migraine, deserve the promised attention particularly, for, as the cause of asthma in the particular condition was discovered we should also have an explanation for diseases of other sorts. From all of this it will be seen that there is a large field for investigation open to the Council. Our present knowledge of asthma and the many problems associated with it is confused. There is a large quantity of material awaiting investigation, for asthma is a very common condition in its numerous different manifestations. Organised research may yield very helpful results. Those suffering from asthma, to whose attention the movement for self-help will now be brought, can assist by taking an active interest in the movement financially and otherwise, while helping with much of the research that does not require special medical knowledge.

PHYSIOLOGICAL CHOLAGOGUES.

THE hypothesis that there is an entero-hepatic circulation of bile—i.e., that a portion of the bile is absorbed from the intestine and on reaching the liver in the portal vein supplies the material for a further secretion of bile—was suggested in 1868 by M. Schiff, as a result of his experiments on dogs by what he called his "amphibolic" fistula. A large fistulous opening was made between the gall-bladder and the surface of the abdomen without ligature of the common bile-duct, and it was found that the bile flowed externally, unless the cannula in the fistula was closed, in which case it passed into the intestine. The quantity of bile obtained in a given period was always much greater immediately after the bile had been allowed to flow into the intestine than when it was allowed to flow externally. It was also noted that the introduction of bile-salts through a fistula in the duodenum increased the quantity of bile. Views on biliary secretion were profoundly changed, however, in 1902, when Bayliss and Starling, by the intravenous injection of secretin free from bile-salts caused a copious secretion of pancreatic juice and doubled the flow of bile from the liver. In 1925 J. Mellanby [1] showed that bile of adequate reaction introduced into the duodenum of the cat caused a large secretion of pancreatic juice—sometimes lasting three hours—owing to secretin being carried by absorbed bile-salts into the portal vein. He has continued [2] his researches in two sets of experiments chiefly on cats and on rats, which have no gall-bladder. To determine how secretin acts as a cholagogue experiments were made on the effects of intravenous injection of purified secretin, also on its possible destruction in the blood, and the effects of its repeated injection and the effect of clamping the pancreatic vein. Purified secretin acts as a cholagogue, as a secondary effect depending on its action on the pancreas. Secretin acts on the pancreas causing a secretion of pancreatic juice and as a result of this glandular activity metabolic products pass into the portal vein and are carried directly to the liver. These metabolic products from the pancreas excite the biliary activity of the liver and cause an increased secretion of bile. To test whether secretin is the immediate excitant of biliary secretion after injection of bile into the duodenum, acidified bile was injected into the ileum. Bile was rapidly secreted, but there was no flow of pancreatic juice, which makes it evident that the liver can secrete bile into the duodenum quite independently of the absorption of secretin into the blood. The experiments show that injection of bile into the duodenum causes a large secretion of pancreatic juice and augments the secretion of bile; a similar injection of bile into the ileum or an intravenous injection of bile-salts will augment the flow of bile, but has no effect on pancreatic secretion. The intravenous injection of purified secretin causes a large secretion of pancreatic juice and augments the flow of bile, but secretin's action as a cholagogue is annulled by procedures which prevent the secretion of pancreatic juice. To sum up: bile-salts, free of secretin and absorbed into the blood from the small intestine, act as cholagogues, whilst the action of secretin as a cholagogue is secondary to its action on the pancreas.

TRAVELLING EXPENSES AND INCOME-TAX.

AN editorial article in the *Journal of the American Medical Association* for Feb. 11th indicates that revenue authorities in the United States discriminate against the medical profession by not allowing the right to deduct in the computation of federal income-tax travelling expenses incurred in attending the meetings of medical bodies. Other professional men and traders, it is suggested, are allowed to make this deduction. In England it is doubtful whether such travelling expenses would be a permissible deduction. The courts have refused to allow any deduction by a professional man for the cost of his annual subscriptions to professional organisations whereby he keeps himself abreast of the latest developments which affect his calling. No general deduction, it seems, can be made for the cost of equipping a professional library, essential though it may be to a practitioner; but it is possible that the cost of purchasing new editions of essential text-books could properly be deducted under the wear-and-tear provisions which a few years ago were extended from trades to professions. Rules 9 and 10 of the relevant schedule of the Income-tax Act do offer some prospect of deducting travelling expenses necessarily incurred in connexion with the

[1] Jour. of Physiol., 1925, lx., 25; see THE LANCET, 1926, i., 920, and ii., 215.

[2] Journal of Physiology, Feb. 10th, 1928.

holding of an office and employment; but their application has not been very liberally interpreted. It has been held that the expenses incurred by a clergyman in travelling from one curacy to another were inadmissible as a deduction, but that he might deduct the cost of visiting his congregation and attending meetings. It was long ago decided that a company director could make no deduction for the expense of travelling from his residence to his office. It was also decided that a solicitor living at Worcester, who happened also to be clerk to the justices at an adjoining town to which he therefore had frequently to travel, could not deduct the expenses of such travel. And, more recently, it was held that a London barrister who was Recorder of Winchester and therefore might have to travel to the latter place four times a year and to stay at a hotel overnight on each occasion, could not deduct his railway and hotel expenses. The idea was apparently that there was no reason why he should not live in Winchester permanently instead of in London, in spite of the notorious fact that barristers of the experience and standing to justify their selection to recorderships do in fact practise their calling in London and must live there. A committee of experts is attempting the almost impossible feat of re-drafting our income-tax laws in simple language. If so it may be hoped that the position of travelling expenses may be made universally plain. The tax-payer at present is driven more and more into the necessity of taking expert advice, and he wonders whether the same standards of relief or otherwise are applied as between one district and another.

STIMULUS IN ECONOMIC LIFE.

THE interrelationship of the sciences has reached such a degree of intensity to-day that it behoves investigators in each field to pause from time to time to examine their categories in order to judge to what extent they have been borrowing concepts which do not, in our present state of knowledge, allow for a universal application. In the mathematical sciences the concepts used appear to be of such absolute validity within a given universe of discourse that to question their validity would merely result in the creation of new concepts to regroup the same facts. Accepting, for example, the Euclidean notion of Space, or the Kantian intuitions of Space and Time, we can arrange phenomena so systematically that scientific prophecy becomes possible over a very wide range. When, however, discrepancies are discovered in the confirmity of phenomena to accepted laws, a new orientation is necessary. This we see in the relativistic modification of Newton's laws. In neurology, or, more broadly, in the biological study of the organism as a system of responses to environmental conditions, the concept of stimulus-response has been of inestimable value in describing processes and even of numerically relating them, as in Weber's and Fechner's Laws. In his Rede Lecture, delivered last year and now reprinted,[1] Sir Josiah Stamp showed how the term Stimulus has been repeatedly invoked to explain phenomena in the social sciences—particularly in economics. Realising the difficulty of applying so simple and abstract a concept as Stimulus to this particular study, the author distinguishes it from incentive and enlargement of scope, and tends to define Stimulus as the increment in incentive which must be distinguished from a mere "shake," which gives the opportunity or the occasion for the "realisation of a scope that is already existent." Furthermore, he adds that we must distinguish those stimuli which merely act as "detonators or catalysts" from such "chemical stimuli" as fertilisers which, actually, are "real additions to the other agents." Sir Josiah explores all the avenues of approach, such as types of stimulus in economics, which give full permanent gains, and those which result in partial gains, status quo returns and full or permanent losses. He exposes the fallacies in the application of the terms to drugs, fertilisers, metal stresses, and economic psychology. In studying his lecture, however, the psychologist may feel a regret that the subject of stimulus and response has not been dealt with from the point of view of dynamic and structure psychology. At the social level of psychology it is surely the whole-felt situation which is met by a highly systematised and dynamic set of purposes or interests (which we call the organism that must be considered, and not the hypothetical units out of which the systems are made. It is doubtful whether in our present state of knowledge it is possible to construct for social phenomena a calculus of increments to explain economic response. Jevons attempted this in his calculus of pleasure and pain. Marshall introduced mathematical graphic methods in his Principles. Recent French work on chronaxie has led to the discovery that within the nervous system Weber's law of psychophysical parallelism holds true. But, with the myriad affective disturbances which qualify group and individual activities, over-simplification and analysis may erect an imposing scaffold which hides the edifice.

[1] Cambridge University Press. Pp. 62. 3s.

AN AMERICAN MEDICAL STUDENT IN 1790.

THE hardships attendant upon practice in country districts has often been a theme for letters and articles appearing in the medical press. Those hardships are real, but the diary of Dr. Eaton, dealing with the conditions existing in New England 130 years ago, makes some of them look very slight.[1] The absence of means of communication, the lack of the necessaries of life, and the primitive methods of practice disclosed in the diary are, of course, long since gone, but it is well to have brought to our knowledge the hard conditions of those far-off days.

The young Thomas Eaton first "talked with his father about going to study physick next summer" on Dec. 2nd, 1791, and was advised to "go by all means." On Jan. 16th, when he was "teaching school, Dr. Butler made me an offer that if I would come and study physick with him, he would take me for 100 dollars (and keep my horse) the whole time for two years, and then if I had a mind to go and ride with Dr. Hassleton a few months he would find me or settle with the doctor. I concluded to give him an answer sometime in the Spring." On March 1st we read that he concluded a bargain with "Doctr. Butler: viz., That I shall live with him two years and as much longer as I please, except I have a mind to spend a few months with Doctr. Hassleton at the last of my time, and if so he is to find me there and my horse at his own cost. He is to board me and my horse and do my washing, &c., and is to have the privelege to ride my horse half enough to pay for the keeping. The first year he is to find all necessary books (except I have a mind to carry a dictionary or two) and am to pay him 30 pounds in cash or stock at cash price, but on the account of his other apprentices it is to be called 40 pounds besides pay for my horse's keeping and if I have a mind to come away any time I have my liberty with paying for the time I am there in proportion to 30 pounds for two years." On the 6th he "sent my snuff-coloured coat, 3 waistcoats, 3 shirts, 2 handkerchiefs, 1 pair of breeches, 2 pairs of stockings, by Doctr. Butler's orders to his house" and must soon have followed his wardrobe for on April 18th he "read 136 pages in Chesleton's Anatomy and got through the second time," only to begin for the third time on the following day. He finished it for the fourth time on May 13th, but never seems to have mastered the spelling of the great surgeon's name, of which he gives another variant later. Anatomy seems to have come no more easily in the eighteenth century than it does to-day! Sunday the 22nd marked his baptism as a surgical dresser, for he "Bled John Marshall, he being the first person that ever I bled." By the 24th

[1] Medical Practice in New England in 1792. Being extracts from the diary of Dr. Thomas Eaton, 1789–1798, and published in the Boston Medical and Surgical Journal for March, 1927, by George Van Ness Dearborn, M.D., Ph.D.

he was a clinical clerk, for he "gathered some snake root." He was no unworthy follower of the great experimenters, for we read that he both bled himself and put a seton into his own leg. The casualty officer will note with a fellow feeling the entry for July 17th: "Pulled a tooth for Joseph Eaton; broke one for John Marshall." By September he had left anatomy behind h m and was "getting through" Sydenham and Boerhaave, Freind's "Emmenologia," Husham "On Fever," and Richard Brookes's "Practice."

An interesting part of the diary is the account given by Dr. Eaton of his visit to the "Pest House" in the following March for the purpose of being inoculated with small-pox. Preparations began on the 21st, when he "swapt stockings with the doctor. Got a pair of linen ones to have to wear to have the small-pox." On the 26th he "rode to the Dr. Jefferies's pest-house in Orange. Inoculated, by his son, Gideon, with the point of the lancet infested, and pierced my wrist very slightly, so that it could not be seen for two or three days after. Agreed to give him 2 pounds for inoculating me and carrying me through the small-pox and he find me in everything." The doctor "would not allow us to eat anything salt, greasy, or sour, but ordered our diet to be skim milk, hasty pudding, and milk porridge. Physic every other morning for three or four days with jalap, &c., and antimony or the essence of antimony so as to work a few times up and down, especially if the stomach be foul; then no more physick at all after the eighth day from the inoculation." Two brief but moving entries record: "Friday, 29th: Took physick. It worked up and down a number of times on each of our company. Sunday, 31st: Took physick again; operated as before." On April 6th his "symptoms held tight. I kept stirring as brisk as possible and feel miserable. My head felt very large and sore and in pain all over. Lost my appetite. I stood it till about sunset, then grew sick at my stomach and a violent pain in my left side. Concluded to bleed myself and go to bed, which eased my pain." That one of the party of five succumbed to the disease given seems not to be a matter calling for much comment by Dr. Eaton, for he merely mentions the fact that he took the disease in a serious form and died: "and a bright young man was he, by name Tristam Coffin, of Epping." All through the year the diary records an alternation of reading—"Chessleton" again in July, Cullen's Nosology and Practice, David Spence's Midwifery, and Samuel Sharp's Surgery—with riding out to bleed, insert setons and prescribe various mixtures and drugs. In July he left Dr. Butler and worked with Dr. Grosvenor. On Oct. 7th he had an attack of influenza "which began with a pain in the breast." The extracts conclude with the proper "happy ending" in 1797, when on Nov. 2nd he "made a request to the parents of Betsy for her to become my wife." On Jan. 3rd they "concluded to be published" and on the 6th "ordered Mr. Greeley to publish me to-morrow." Not even the excitements of a wedding day could abate the young Thomas's ardour for accounts: "Married by Reverend Moses Bradford, for which I reward him with 2 dollars." Gowned in a pink satin pelisse, the 16-year-old Betsy Eaton rode home with her husband on a white horse, and they lived happily ever after.

A MEDICAL MILLENNIUM.

Mr. J. G. Legge is anxious to save the English people from its medical friends, and his amusing book [1] on bureaucracy in public health will be read with interest by those who believe, as he does, that the attempt is still worth making. The scene of his story is laid in England in the period immediately following the war, when everyone was trying to build a New Jerusalem or at the very least Homes for Heroes—the so-called Period of Reconstruction. It opens with the launching of a Ministry of Hygiene which has three main planks in its platform—a housing scheme, a plan for improving the weather by bringing artificial sunlight to the masses, and a proposal to enforce health on the population by such measures as compulsory periodical examinations, compulsory notification of all diseases, and the establishment of a sanitary police force and courts of hygiene. The execution of this policy involves a good deal of wire-pulling and intrigue, and these, together with the measures taken to influence public opinion, are described with a detail that suggests inside knowledge of political life. Parliamentary opposition to the clause of the Bill which establishes the sanitary police and machinery for registration eventually prove so great that the Prime Minister (who makes dramatic appearances in England in the intervals of attending conferences at foreign spas) decides not to enforce the measure throughout the country, but to allow local authorities to adopt it if they wish. The rest of the book deals with the scheme's application at "Rushington," a progressive town in the North Midlands, under the leadership of its enthusiastic but rather ingenuous medical officer of health, Dr. Jollop. At first the inhabitants of Rushington rather enjoyed being told, by charming young ladies in sky-blue uniforms, to exchange their unhygienic headgear for the new sanitary hat, but when they found that the laws had to be taken seriously, when doctors were fined for sleeping with their windows shut and aldermen were forcibly dieted for their corpulence, there was no end of a row. Finally, after the intervention of a climbing and treacherous ex-member of the city council the financial screw was applied by the Ministry of Hygiene itself and the scheme was withdrawn. The moral of this book is contained in the quotation from "Erewhon" placed at the beginning. "Happily, common sense, though she is by nature the gentlest creature living, when she feels the knife at her throat, is apt to develop unexpected powers of resistance, and to send doctrinaires flying, even when they have bound her down and think they have her at their mercy."

[1] The Millennium. By J. G. Legge. Oxford: Basil Blackwell. Pp. 164. 5s.

LIVER EXTRACT IN PERNICIOUS ANÆMIA.

WE published last week a preliminary report by the Medical Research Council upon the use of liver extract in the treatment of pernicious anæmia. Numerous requests having been received by the Council for particulars of the method of preparing the extract, it has been thought desirable to publish the details of the process by which the material was prepared for the trial organised by the Council. The method is as follows:—

To 100 kg. minced fresh ox-liver add 132 litres of 80 per cent. alcohol and 109 c.c. of 50 per cent. (vol.) H_2SO_4. Stir frequently and filter after 12–18 hours. Suspend the tissue again in 250 litres of 50 per cent. alcohol, stir frequently and filter after 12–18 hours. Evaporate the combined filtrates *in vacuo* to a volume of about 10 litres. Add 10 litres of absolute alcohol. A flocculent precipitate is formed which settles. The supernatant fluid is removed and the residue is centrifuged and washed with 50 per cent. alcohol. The alcoholic liquid and washings are combined, evaporated *in vacuo* to as small a volume as possible and then poured, with constant stirring, into ten volumes of absolute alcohol. The syrupy liquid is slowly dehydrated by the alcohol and assumes a toffee-like consistency. This material is pulled into long shreds to expose fresh surfaces to the dehydrating action of the alcohol. When the dehydrating action of the alcohol is exhausted it is replaced by fresh alcohol and the material is broken up and eventually becomes brittle. It is then filtered off and dried (*in vacuo* over H_2SO_4, or by other suitable means). It is then powdered rapidly and again dried as before. The material must be exposed to the air during these operations as little as possible, as it is very hygroscopic. The dry powder is transferred to tubes, each of which should contain an amount equivalent to 250 g. of the original fresh liver.

It is to be noted that the method here described is based upon the American process of which an account has been published by Cohn and his co-workers. As was stated in the Council's report, this particular modification has not necessarily any peculiar value as compared either with the original process or with

possible alternatives, but the experiments made for the Council have shown that it is one which is capable of ready application on a large scale, and which, according to the clinical indications, yields a satisfactory product.

THE GROWTH OF POPULATIONS.

THOUGH it is difficult to wrench the mind to a full realisation of the implications of the prospect, there seems to be very little doubt that the population of this country will become stationary in another 20 years or so unless some revolutionary change in our relation to our environment intervenes. Experts who study the question all come to the same conclusion. Prof. A. L. Bowley takes the facts of death-rates and birth-rates in relation to the age-distribution of the population as they stand, and predicts the rapid attainment of a population in which births and deaths will just about balance one another. Prof. Raymond Pearl reaches the same conclusion on broader biological lines, and publishes in the last number of his *Quarterly Review of Biology* [1] a revised version of a paper [2] which he read at the World Population Congress at Geneva last year when, as some of our readers may remember, he also lectured on the subject in London. He finds that populations of all kinds—bacteria, yeast, the fly *Drosophila*, and man—follow the same curve of growth, increasing slowly at first, then faster and faster (as we did in the first two-thirds of the nineteenth century), and then gradually slowing off until the rate of increase becomes imperceptible. His diagrams certainly show a remarkable similarity which makes it easy to believe that the same explanation must underlie the whole of them. He points out that this uniform type of curve is derived from death-rates and birth-rates if it is postulated (1) that birth-rates are much diminished by small increases of density of population when the density is thin, and relatively little afterwards when the density becomes greater; and (2) that death-rates are not much increased by increasing density of population until the density becomes considerable. Experiments with *Drosophila* show these relations between births, deaths, and density, which between them account adequately for the facts observed in the growth of experimental populations, and the similarity of the main phenomena with those observed in man makes it at least possible that the same factors are important for human populations too. "High" and "low" densities of population cannot, of course, be defined numerically; they differ very widely in different species and, in the same species, depend on the environment. Like other animals, man adjusts his density to his surroundings and tends to have the largest population which is compatible with the comfort and convenience which he judges to be the necessary minimum; the abundance of a plant population depends chiefly on the room available, of rats on the food-supply, and of man on the same and similar considerations; the density in 1900 in this country would have been impossible overcrowding in 1600. The prospect of a stationary population is cause for neither glee nor apprehension; if man is following a general biological law, it is inevitable and presumably good for him.

CAROTINÆMIA.

IN a recent paper on this subject Dr. Willard C. Stoner,[3] of St. Luke's Hospital, Cleveland, who describes a case of his own, remarks that after the war German authors described under the name of carotinæmia a number of cases with a peculiar discoloration of the skin which was obviously due to the high vegetable diet of the population.[4] The condition was most often seen in children who had been having exclusively vegetable diets rich in carrots and greens. The chief interest of the condition, which is unaccompanied by any symptom of constitutional disturbance, lies in the fact that it may be confused with true jaundice, the principal difference being the absence of pigmentation of the sclerotics of patients with carotinæmia. The cutaneous discoloration is due to "lipochromes" which are found in substances such as milk fat, yolk of egg, body fat, and certain vegetables such as carrots, green vegetables, and oranges. Their excretion sometimes alters the colour of the urine. Dr. Stoner's case is unusual in that it occurred in an adult, a woman aged 65, who had been living almost exclusively on a diet of vegetables, including carrots, for several months. The skin showed a slight generalised yellowish pigmentation, which was most intense on the palms and soles. There was no pruritus—a symptom which is usual in jaundice—and the sclerotics were not discoloured. The temperature was normal, and apart from flatulence and constipation, which had been present for years, no other symptoms were noted. Examination of the urine was negative, but appropriate tests showed carotin in the blood. What finally happened to the patient is not reported, but presumably, as in other cases on record, the discoloration of the skin disappeared when the diet was changed.

WHAT IS CELL RESEARCH?

UNDER this title our Budapest Correspondent sends an account (p. 572) of a lecture by Prof. Michael Lenhossék, in which attention is again drawn to the revival of interest in normal and pathological histology. For those who could see a little deeper than the crest of the wave, these subjects never have been dead, they must always be the basis of our knowledge of the structure of the normal and the abnormal. But the study of histology is tedious and difficult; results demand great industry, and are much more easy to obtain in other fields. Though accepting the dictum that function is dependent on structure, both physiologists and pathologists have tended to explore other paths in their search for the truth. It is, and has been, very necessary that they should do so, but it is a matter for general congratulation that interest has become focused once more on what are, after all, basic studies. This happy result is entirely due to the adoption of the experimental method. By vital staining methods, and by micro-dissection and manipulation, it has become possible to learn more about the structure and behaviour of the living cell than could be hoped for by the study of fixed and stained material alone. Probably the most important technique of all is that of tissue culture. The possibility, first shown by Ross Harrison some 20 years ago, of growing cells outside the body, just as bacteria are grown, has opened up lines of investigation of great promise. For the most part this method has been used by pathologists, and for the investigation of cancer. But it should have a much wider field. The substitution of artificial media for the fluids of the body has made the technique of tissue culture easier than it was, but it is still much too difficult for universal application. If and when it becomes simplified it should be feasible to study the growth and structure of the living cell in a way which is at present impossible; and by using the growing cells as indicators of the nature of the medium on which they are growing, to investigate those problems of metabolism and environment which now elude us. It would be unwise, however, to draw inferences too readily from the behaviour of cells in vitro, for the cells of the tissue culture approximate closely to unicellular organisms, and it would be just as fallacious to seek the answer to the questions of human physiology from the behaviour of the amœba as to expect the tissue culture to be entirely representative of the body tissues. While welcoming these new means of

[1] Vol. ii., p. 532. English agents: Messrs. Baillière, Tindall and Cox. [2] THE LANCET, 1927, ii., 726.
[3] American Journal of the Medical Sciences, January, 1928.
[4] See also THE LANCET, 1920, i., 106.

investigation, it should not be forgotten that the experimental method can be applied with benefit to the older techniques—and inasmuch as the whole basis of the experimental method is adequate control, the workers in the more dynamic forms of histology must always be prepared to check their results by resort to the older techniques.

THE DISCOVERY OF ETHER ANÆSTHESIA.

THE granting of official rewards for scientific discoveries is always attended with the difficulty of distinguishing between the claims of rival discoverers, for the ground may be prepared by unrecognised workers, and the actual reaping is inevitable. The recognition of the truth may be delayed perhaps, but sooner or later it must be perceived, and it is hard to say whether he who enunciates it is more worthy of recognition than those who made his discovery possible. There seems to be no doubt that Crawford W. Long performed on March 30th, 1842, the first operation to be carried out under ether anæsthesia, and it is exceedingly interesting to learn how this came about.[1] It appears that in the first half of the nineteenth century certain individuals used to travel about England and the United States lecturing on chemistry. During these lectures it was the custom to invite members of the audience on to the stage to inhale laughing gas and ether vapour for the purpose of causing exhilaration and mirth-provoking antics. The inhalation of ether to produce excitement and exhilaration became quite popular. Dr. Long introduced it to his circle, and it is amazing to us to read that he and his friends used to indulge in "ether frolics." Long noticed that he and others sustained bruises and minor injuries while under the influence of ether without any consciousness of pain, and it occurred to him that he had at his command a means of obviating the terror of a surgical operation. And so from what we should regard as a highly reprehensible practice came the wonderful discovery of ether anæsthesia. Mrs. Frances Long Taylor, with the intent to establish her father's claim to be the discoverer of ether anæsthesia, has drawn the picture of a fine and distinguished man.

THE Lumleian lectures will be delivered at the Royal College of Physicians of London, Pall Mall East, S.W., on March 22nd, 27th, and 29th, at 5 P.M., by Dr. James Collier. His subject will be Epilepsy, and members of the medical profession will be admitted on presentation of a visiting-card.

[1] Crawford W. Long and the Discovery of Ether Anæsthesia. By Frances Long Taylor. New York: Paul B. Hoeber. 1928. Pp. 237. $4.

EASTER TUBERCULOSIS CONFERENCE.—A provincial meeting of the Tuberculosis Society and of the Society of Superintendents of Tuberculosis Institutions will be held at Oxford from March 29th to 31st, and the Conference will deal in successive sessions with four subjects—Lupus and its Treatment; speakers, Sir StClair Thomson, Dr. W. J. O'Donovan. The Potentially Tuberculous Child; speakers, Dr. A. L. Ormerod, Dr. G. Macdonald, Dr. Esther Carling. Treatment of Hæmoptysis in Pulmonary Tuberculosis; speaker, Dr. Clive Riviere. Intestinal Tuberculosis; speakers, Prof. M. J. Stewart, Mr. L. E. Barrington-Ward, Dr. Marcus Paterson. The Chairmen at successive sessions will be Sir Farquhar Buzzard, Sir StClair Thomson, Prof. Lyle Cummins, Dr. F. R. Walters. The meetings will be held in the pathological lecture theatre at the Dunn Laboratory. The annual meetings of both Societies will take place at the Clarendon Hotel on the evening of the 29th, and on the following evening there will be a dinner to entertain visitors. Accommodation can be arranged at the Clarendon Hotel, for any who wish to avail themselves of it, on application to Dr. G. T. Hebert, Tuberculosis Department, St. Thomas's Hospital, London, S.E. 1.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXVII.

THE TREATMENT OF HEAD INJURIES.

I. GENERAL MANAGEMENT.*

THE treatment of head injuries causes more anxiety than almost any other emergency of practice, and in the early stages prognosis is quite uncertain. Each case differs from the last in the manner of its evolution, and successful management depends on close and continuous observation of the signs during the period of danger, and on a clear understanding of the many pathological processes that may be set in train.

Emergency Treatment.

We are called, let us say, to treat a head injury shortly after the accident has occurred. The unconscious patient has been removed to the nearest shelter. A hasty examination is made to answer the following questions: (1) Is the patient collapsed? (2) Is there bleeding from the scalp? (3) Are there any fractures of the limbs? At this stage the patient is interfered with as little as possible, and if he shows signs of collapse it may be necessary to delay his removal to hospital for an hour or so, until his pulse has rallied. Stimulants are to be avoided; the state of concussion is one which tends towards spontaneous recovery, and any artificial stimulation of the blood pressure is likely to increase the risk of subsequent intracranial hæmorrhage. Cases which at this stage are showing signs of increasing collapse are inevitably fatal.

The patient is kept warm and is placed in such a position that his breathing is free. Bleeding from a lacerated scalp can be easily controlled by digital compression of the scalp against the intact part of the skull on each side of the laceration, if necessary at considerable distance from the wound itself. This is a matter which can be delegated to lay assistants after slight tuition. Tourniquets for the scalp are less satisfactory than pressure by the fingers, for they are apt to slip.

It is of great importance that the patient should be removed to a hospital or nursing home rather than to his own house. It is impossible to foretell at this stage whether an operation will later be required. Moreover, in hospital it is more easy to make the systematic observations that are necessary for the successful management of each case, and to enforce the prolonged rest in bed on which complete and permanent recovery so often depends.

Systematic Observations.

Apart from the care of open wounds of the head, which will be considered later, the treatment of a patient who is suffering from a recent head injury is at first essentially conservative. He is placed in a warm bed in a room free from noise, and the following observations are made:—

(1) The state of consciousness. If the patient is unconscious the depth of coma should be investigated by noting the pupillary and corneal reflexes, the response to pin-prick, the flaccidity of the limbs and so forth.
(2) The state of the pulse, temperature, respiration, and blood pressure.
(3) The size and reaction of the pupils.
(4) The sensation and, if possible, the movements of the limbs and face.

These observations should be made every hour, and the facts noted should be committed to paper at the time.

It is well to remember that an unconscious patient bearing the marks of a head injury is not necessarily suffering from the effects of head injury. In hospital practice, especially, a number of other conditions frequently masquerade as head injury—notably

* A second part will be published next week.

cerebral hæmorrhage, ruptured cerebral aneurysm, cerebral thrombosis, and acute alcoholism. Moreover, the irritability of a patient with severe traumatic intracranial hæmorrhage may closely simulate that of acute alcoholism. For the differentiation of these conditions lumbar puncture is of definite value. Blood is rarely absent from the cerebro-spinal fluid in severe intracranial trauma.

Though fractures of the skull are often absent and always relatively unimportant in head injuries, and though their discovery may even be confusing if it is not borne in mind that the greatest damage of the brain is apt to be, as a result of contre coup, on the opposite side of the head, it is nevertheless advisable that skiagrams of the skull should be taken. Occasionally they give information which is of immediate value, but their chief importance is medico-legal. X ray examination is best made as soon as the patient is admitted to hospital and before he is put to bed, as undue movement is in this way avoided.

The Classification of Cases.

During the period of observation it is necessary to make some estimate of the type of case being dealt with, in order that a rational line of treatment may be pursued. It will be found that each case can be assigned to one or other of the following groups.

(*a*) *Fatal Cases.*—In some cases deep coma is maintained from the moment of injury; while the respiration grows more stertorous, the pupils become dilated and inactive, and the blood pressure and temperature mount rapidly. These signs indicate a greatly raised intracranial pressure, due to damage of the vital centres that we are powerless to repair. Such cases are invariably fatal. Operation, it should be emphasised, is of no avail in this type of case.

(*b*) *Mild Cases.*—In other cases it soon becomes evident that recovery is taking place. The initial unconsciousness is of short duration and is followed by a stage of reaction, in which the patient is apt to be extremely irritable and liable to sudden attacks of vomiting. There is severe headache. These are cases of mild concussion and contusion, and they are treated conservatively by methods to be described later.

(*c*) *Doubtful Cases.*—There is another group of cases in which the issue remains for some time in doubt. For a day or more the patient remains unconscious, or shows periods of semi-consciousness alternating with periods of actual coma. These are cases of severe contusion and laceration of the brain with secondary œdema. There is a moderately severe and sustained rise of intracranial pressure. Treatment is carried out on conservative lines, unless there are persistent focal signs to indicate an area of local contusion for which operative decompression will be of value.

Other doubtful cases are those which show what is known as the "lucid interval." The patient recovers partially or completely from the unconsciousness of concussion, but, after a lucid interval of variable duration, lapses once more into coma. In this category also are those cases in which the patient is only dazed at the moment of injury and is able to walk up to hospital, but then becomes unconscious. The lucid interval is an indication that the compression, or rise of intracranial pressure, which produces the secondary state of unconsciousness, is due to gradually accumulating intracranial hæmorrhage, such as hæmorrhage from the middle meningeal artery, or to a gradually developing cerebral œdema, rather than to actual damage to the brain at the time of the injury. It is not always easy to know, after a patient has recovered from the initial unconsciousness of concussion, whether he is merely drowsy or whether he is passing into the coma of compression. Here we are guided by our systematic observations; the onset of compression is associated with slowing of the pulse, rise of temperature, and, most important of all, with a rise of blood pressure.

Those which show the lucid interval call for operation more than any other cases of head injury, with the exception of those in which there are compound fractures of the vault of the skull. Conservative treatment may be tried for a short time if the rise of intracranial pressure is not rapid, but should be immediately abandoned for operative treatment if it meets with no success.

Prevention of Infection.

While an attempt is being made to ascertain the extent of injury to the brain the spread of infection to the brain through open wounds must be prevented. Compound fractures of the vault of the skull call for immediate operative treatment, in a manner to be described. A leakage of blood or cerebro-spinal fluid from the nose or ears is presumptive evidence of an open wound through fracture of the base of the skull. In such cases also there is risk of meningitis. The external ear should be gently swabbed out—*never syringed*—with a mild antiseptic, such as perchloride of mercury 1/1000, and the auditory canal should be lightly plugged with a pledget of gauze, soaked in similar solution, which is changed every hour. For a leak of blood and cerebro-spinal fluid through the nose all that can be done is to keep the anterior nares free from clot. Urotropine, grs. x. t.d.s., should be given by mouth whenever meningitis is feared.

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Special Articles.

NATIONAL HEALTH INSURANCE.

A BILL TO SUPPLEMENT THE ACTS OF 1924 AND 1926.

THE National Health Insurance Bill just presented to Parliament is of interest to the medical profession for its omissions rather than for what it contains. The official memorandum, explanatory of the Bill, which has been issued as a Command paper,[1] states that the Bill—containing 22 clauses and two schedules of some length—is based mainly on the Majority Report of the Royal Commission. It will be found on examination of the contents of the Bill that this does not mean that the Bill gives effect to the main recommendations of the Commission, at least so far as the medical service for the insured is concerned.

Its Scope and Limitations.

It has already been stated in Parliament that the Government do not propose to accept the recommendations of the Royal Commission as to the abolition of insurance committees or as to the partial pooling of the surpluses of approved societies. The Bill accordingly contains nothing on these subjects. The fresh lease of life for insurance committees is of interest as a further illustration of the vigour of those bodies whose existence is threatened from time to time. The absence of any provision for the partial pooling of the surpluses of approved societies is disappointing for those who had hoped for a much-needed improvement of the medical service for the insured. For it was by such means that the proposed extensions of this service were, in the view of the Royal Commission, to be financed. It may be recalled by those who studied the report of that body early in 1926[2] that the Commission placed their recommendations in regard to extensions and improvements in the insurance service in order of priority, and gave first place to the widening of the scope of medical benefit so as to include the provision of (*a*) expert medical advice and treatment for persons who can travel to meet the specialist; (*b*) expert advice for persons who are unable to travel; and (*c*) laboratory services. We stated at the time that—

this recommendation has very properly been given priority as the medical benefit under the Act has suffered throughout

[1] Cmd. 3051. H.M. Stationery Office. 3*d*.
[2] See THE LANCET, 1926, i., 501, 515, and 676.

from limitations imposed by financial considerations, and stated by the Commission to call urgently for removal. It would seem that, owing to the fact that sickness has cost less than was originally anticipated, there is a margin available out of the present contributions, and the Commission expressly recommends that this margin should be applied to its full extent towards meeting the cost of extending the statutory benefits. The medical profession, as made clear by their evidence, are ready to coöperate with the Government in bringing into operation the extension of the scope of medical benefit which is contemplated.

The greater part of the "margin" was shortly afterwards employed to bring about a reduction in the Exchequer contribution towards the cost of benefits generally, and the proposal that remained—that one-half of the future surpluses of approved societies should be used to find the money for a general extension of the medical service, estimated to cost a million and a half pounds per annum—now finds no place in the Bill which is based on the Commission's report.

Inequalities of Benefit.

With regard to the value of the medical service for the insured, the Commission reported that the general acceptance of the system during the 13 years since its introduction, the absence of any substantial volume of criticism of it apart from the question of scope already referred to, and the wide demand for its extension, were in themselves evidence of a favourable kind.

We must suppose that there are grounds, financial or otherwise, which commend themselves to the Minister of Health as adequate for the failure to give effect to any recommendation of the Royal Commission for extension of benefit, not even that placed first in order of priority. The system therefore continues by which those societies having surpluses apply the whole available surplus (that is, that part of the surplus declared on the quinquennial valuation to be available for the purpose) to certain statutory "additional benefits." It is worth recalling what the Commission had to say in regard to the resultant inequalities of benefit.

> We received much evidence in criticism of the inequalities of benefit which result from the variations between the valuation surpluses of approved societies and of the confusion alleged to be consequent on the comparative freedom which societies enjoy in selecting and, indeed, in defining the content of additional benefits other than the increase in the rates of the cash benefits. . . . Other witnesses contended vigorously for the maintenance of the present system. . . . Some of those who advanced this claim relied on pledges given when the Bill of 1911 was before Parliament, to the effect that, to meet this difficulty, insured persons should be free to choose their own societies and the societies should have full control of their own surpluses. In this particular sphere, indeed, it became evident that we had to recognise the existence of opposed and apparently irreconcilable opinions held in each case by schools of thought whose views were entitled to respect and consideration.

List of Additional Benefits.

The complete list of "additional benefits" appears in the new Bill in substitution of existing lists, and is as follows:—

1. An increase of sickness benefit and disablement benefit.
2. The payment of sickness benefit from the first day of incapacity.
3. An increase of maternity benefit.
4. Allowances to a member during convalescence from some disease or disablement.
5. Payments to or on behalf of members who are in want or distress.
6. Payments to members not allowed to attend work on account of infection.
7. Repayment of the whole or any part of contributions payable under this Act by members of the society or any class thereof.
8. The payment of the whole or any part of the cost of the provision of dental treatment.
11. The provision of premises suitable for convalescent homes and the maintenance of such homes.

* * *

9. Payments to hospitals in respect of the maintenance and treatment therein of members, and the payment of the whole or any part of the travelling expenses incurred by or in respect of members in travelling to and from hospitals.
10. The payment of the whole or any part of the cost of maintenance and treatment of members in convalescent homes, and the payment of the whole or any part of the travelling expenses incurred by or in respect of members in travelling to and from convalescent homes.
12. The payment of the whole or any part of the cost of medical and surgical appliances, other than dental and optical appliances and those provided as part of medical benefit.
13. The payment of the whole or any part of the cost of the provision of ophthalmic treatment (other than as provided as part of medical benefit) and the whole or any part of the cost of optical appliances.
14. The payment of the whole or any part of the cost of the provision of nurses for members.
15. Payments to approved charitable institutions in respect of any treatment of members required for the prevention or cure of disease, not being treatment within the scope of any other additional benefit or of medical benefit.
16. Such other additional benefits, being of a character similar to that of any of those hereinbefore mentioned, as may be prescribed.

New and Old Benefits.

This list is of interest to doctors, who are frequently asked by their patients about these additional benefits. They can merely refer the inquirers to their respective societies who, where there is an available surplus, may provide one or more of these benefits. All that the doctor can say with reasonable certainty is that any form of benefit not in the list cannot be obtained under the Insurance Acts. For instance, the proposed extension of medical services to which we have referred does not appear in the list. It is subject to the same objection as that which has now disappeared from the list, but which was always, and would have remained, a "dead letter"—the provision of medical treatment for the dependants of an insured person. In recommending its removal from the list, the Royal Commission said that an extension of the scope of medical benefit should not be made in this way (that is, in certain cases and not in others), and that it was in fact impracticable, as it would have to be administered by the insurance committee responsible for the administration of medical benefit and not by the society having a surplus which it proposed to devote to this purpose. (It will be borne in mind that one society may have members spread throughout the country in a large number of insurance committee areas.) The extension of medical benefit to dependants of insured persons generally was out of the question because of its great cost.

In the above list we have transposed item 11 so as to show, below the line of asterisks, all those benefits which did not appear in the Act of 1924; some have been prescribed since that date by departmental regulation, others are new. It is important to observe with regard to these generally that a long-standing question, as to whether certain forms of benefit appearing in the list are or are not "in the nature of medical benefit," and therefore due to be administered by insurance committees, is settled by including all additional benefits in one class and making it clear that they are administered by approved societies. A distinct gain in the control and standard of these various benefits is secured by the provision in the Bill that regulations may be made by the Minister in regard to them. The explanatory memorandum says that these regulations are required in order to secure that the large sums (approximately £4,000,000 a year) now spent by upwards of 7000 societies and branches on additional benefits in the form of treatment shall be administered with a proper standard of efficiency and uniformity, and in the best interests of the members.

The memorandum adds that if any of the forms of treatment at present covered by additional benefits should at any future time be made generally available to all insured persons as statutory benefits their administration would be transferred to the insurance committees on lines similar to those at present governing the administration of medical benefit.

Other Provisions.

Amongst the other provisions of the Bill of general interest to practitioners may be noted—

the fact that all persons on ceasing to be employed are to remain fully insured for all benefits over an average period of one year and nine months (this period commencing, where the unemployment is due to sickness, after the sickness terminates);

a clause which prevents bodies of persons from contracting out of the medical benefit provisions of the Acts by taking advantage of a provision—intended for individuals making their "own arrangements"—to secure, in effect, the recognition of medical institutions which would otherwise be outside the Act;

a more careful regulation of the right of societies to subscribe to a "charitable institution" and a definition of such an institution which makes it clear that it must have a real and substantial charitable element and not be merely a body financed by approved societies and designed to give treatment beyond the control of the Minister of Health; and

a minor provision by which medical benefit includes, in addition to provision of medicines, such chemical reagents as may be prescribed; this will, for example, give the department the opportunity of regularising the use of Fehling's solution (which has been held to be not a "medicine") in connexion with the administration of insulin.

MODERN RADIOLOGICAL EQUIPMENT.

THE NEW DEPARTMENT AT EDINBURGH.

THE new Radiological Department at the Royal Infirmary, Edinburgh, is an outstanding sign of the important position which radiology has reached at the present day. In the past, the visitor to an unknown hospital, desirous of finding the X ray department, had only to descend to the cellars, in the darkest and most noisome corner of which the department would certainly be found. The idea that any place is good enough for the radiologist is slowly passing away, and in the future the X ray department of an up-to-date hospital will be planned and built from the very beginning with a view to fitness for its special work, as in the case of the Edinburgh department.

General Arrangement.

The building, which was opened on Oct. 9th, 1926, by the Duke of York, is 170 feet long, with an average width of 60 feet. It consists of a basement and two floors, with a flat roof. It is built along the eastern side of the curved passage between the surgical and medical blocks, known to all Edinburgh medicals as the "duodenum." The building is of steel-framed construction with reinforced concrete floors and roof, and with walls of Craigmillar stone. It is consequently fire- and sound-proof. One of the most important factors in the design of rooms in which X radiations of high penetration are to be generated is the provision of adequate protection of the operators and the prevention of the escape of radiations which might in time affect workers in adjacent rooms. In the past this second end has been achieved by lining the walls and doors with heavy sheet lead, but in a building of such size as this the cost would have been prohibitive. It was therefore decided to incorporate the protection in the building material used for the construction of the walls. Concrete slabs of the following composition were used: rough sand, 1 part; engine ashes, 2 parts; Portland cement, 1 part; barium sulphate, 3 parts. The slabs were tongued and grooved, and when built the walls were coated on each side with a layer of barium plaster ¾ inch thick. The walls and ceilings were also coated with this plaster. All screening, radiographic, and treatment rooms were thus protected. The National Physical Laboratory reported that the finished walls gave protection equivalent to 5 mm. thickness of metallic lead, when a peak voltage of 100 k.v. was applied to the tube. The doors are protected with 6 lb. lead on both sides. The radiographic and screening rooms are provided with protected cubicles, built with the same barium slabs, in which all controls are placed. The meters and patient are observed through windows glazed with two thicknesses of "Super Protex" lead glass, giving protection equal to 5 mm. of lead.

Further points of the greatest importance in the design of a radiological department are the avoidance of the noise of rotating machinery and of corona high-tension discharges, with the consequent pollution of the air of the rooms by ozone and oxides of nitrogen. In the Edinburgh department all rotating machinery has been placed in the basement, in one large machine room with thick rubber flooring.

The Electrical Installation.

Direct current at 460 volts, from the town mains, is brought into this room, and used to drive a motor generator of 42 k.w. capacity, which supplies alternating current at 200 v. 50 cycles to the whole department. There is also a 3 k.w. rotary convertor for use with an emergency set. A third 1 k.w. motor generator supplies D.C. at 80 volts for electrical treatment. The switch gear for both D.C. and A.C. sides of the main generator is grouped in the centre of the room, the wiring at the back being completely caged in. To avoid inconstancy of radiographic results, due to voltage changes resulting either from changes of load in the department or from line fluctuations in the town supply, a Tirrill automatic voltage regulator is used to control the output of the 42 k.w. motor generator. In practice this instrument is very satisfactory, the 200 volt A.C. supply being always perfectly steady. Three oil-immersed 10 k.v.a. high-tension transformers are installed in the machine room, each being directly under an X ray room on the floor above. The high-tension current is led up to the room above by aluminium tubing passing through glass insulators in the machine room ceiling. Each transformer is capable of an output of 100 m.a. at 150,000 volts (peak), and is controlled from a trolley table in the cubicle in the room above. Each transformer, with its mechanical rectifier and coolidge transformer is enclosed in a metal cage, on the door of which is a red danger sign, which lights up automatically when the main switch in the corresponding room above is closed, thus warning anyone below that the transformer is about to be energised.

These transformer units feed the two screening rooms and the main radiographic room. Next to the machine room is a mechanics' workshop, well equipped with electrically driven machine tools. There is also a very large fireproof room for filing films returned from the wards.

As a result of the grouping of the machinery in the basement there is no perceptible noise or vibration in the X ray rooms. When a screen room is in use, the only sound is a faint hum from the corresponding rectifier below. As all the high-tension wiring is carried out with smooth tubing, sharp bends being avoided, there is no corona in any of the rooms. Ventilation is carried out by a system of air extraction ducts at ceiling level, three high-speed electric extraction fans, for the different sections of the building, being installed in one roof tower, while fresh air inlets are provided at ground level. Practically all the rooms have wash-hand basins with hot and cold water, and all are floored with polished oak. In the corridors the floors and wall dado are of white terrazzo, with light blue decoration.

Radiographic Rooms.

An automatic push-button control passenger lift connects the basement with the floors above. On the first floor is the office at which patients are received, two radiographic rooms, dark rooms, director's room and secretary's room, deep and superficial therapy rooms. There are also a lecture or demonstration room and various staff rooms. The main radiographic room, fed from one of the transformer sets in the basement, contains a Bucky couch, ordinary couch for radiography, and a screening couch for localisation work. As all the controls, including an electro-magnetic remote control for the Bucky

diaphragm, are in the completely protected cubicle, the operator in this room is never exposed to X rays at all, as the tube can only be switched on from inside the cubicle. In the partition wall between the radiographic room and the dark room are two hatches with double lead doors. Through one of these fresh cassettes are obtained, while the exposed ones are passed in through the other. The two screening rooms are similar to each other, one being mainly intended for gastro-intestinal work, and the other for chest cases. Both have three section screening stands.

These consist of a large framework fixed to the floor and carrying the tube box. This, though very heavily protected with lead, can be moved with great ease in both horizontal and vertical planes. The section on which the patient stands, and the third one carrying the operator's seat, both run on rails allowing the patient to be moved away from the tube for tele-radiography. In front of the operator's seat is a counter-weighted, lead-protected, wooden screen with side wings, which normally rises and overlaps the lead glass protection of the fluorescent screen. It can be depressed temporarily to allow of palpation. This arrangement makes the wearing of a lead-rubber apron quite unnecessary. Each room also has a screening couch, with the fullest protection. One screening room has a Selecteur Béclère apparatus for rapid serial radiography of the duodenum, while the other has an apparatus with slot diaphragm and moving film for recording the movements of the heart. Both rooms are rapidly darkened by lowering a steel roller blind by means of gearing, but when not in use they can be thoroughly aired and exposed to daylight. Both have all controls inside the cubicle. All the high-tension wiring is carried out with aluminium tubing, supported by insulators fixed to the ceiling. Connexion to the various units is made by means of overhead H.T. switches, which instantly change over both H.T. and filament currents, without disconnecting any wires by hand. Both wiring and switches are entirely corona-less. Where the H.T. feeders enter the room through the floor, they are enclosed in a metal cage, to a height of 8 ft.

The large lecture room is equipped with viewing boxes, two stereoscopes, and a projection lantern.

Treatment Rooms.

Both deep and superficial therapy rooms open into a large operators' room, in which the workers are entirely protected from radiation by the barium walls and lead doors. The respective switchboards are at the side of lead glass windows through which the patients are watched.

In both rooms the high tension generators are the Gaiffe-Pilon constant current apparatus, which employs high-tension transformers, charging up large condensers through rectifying valves of the hot cathode type. The steady "overflow" from the charged condensers constitutes the high-tension supply to the X ray tubes. An oscillographic record of the current curve of this type of high-tension generator results in an almost straight line, which indicates that the voltage generated is almost constant, there being only a slight ripple. This means that the X ray beam emitted by the tube is practically homogeneous as regards wave-length. Moreover, the life of the tubes is prolonged as their anticathodes are not subjected to the rapid heating and cooling which occurs when a tube is energised by ordinary rectified A.C., and which causes a breaking up of the tungsten at the focal point. The high-voltage generator, which is placed in a safety cage inside the deep therapy room, is capable of an output of 10 m.a. at 250,000 volts. The hot cathode X ray tubes are immersed, for insulation and cooling, in oil which is contained in a metal tank. The oil is cooled by a radiator immersed in it through which cold water circulates. The tank is entirely surrounded by 6 mm. of lead, with the exception of the small aperture through which the X rays are emitted.

Patients may be treated singly, or two can be irradiated simultaneously, in which case the two tubes are used in parallel from the one generator. In this case both tubes have the same applied potential, but the milliampèrage through them is under independent control. A similar, but smaller, constant current generator with an output of 10 m.a. at 125,000 volts, supplies the superficial therapy room. A striking feature of both these high-tension generators is their silence and absolute steadiness when in operation. Once the kilovolt and milliampère meters have been set to the desired reading, they remain there without any fluctuation throughout any length of treatment. Notable characteristics of both therapy rooms are their great height, absence of corona, and excellent ventilation, all factors of the greatest importance if sickness after treatment is to be avoided. A complete X ray unit, with transformer and combined couch and screening stand, is provided in the emergency room. This transformer can be supplied either from the main motor generator or from a 3 k.w. rotary converter which, though situated in the basement, is controlled from the emergency room itself. This allows of the use of the equipment when the main generator is not running. Dental radiography is also done in this room. The Victor dental set is used, with a dental chair with full movements.

The dark rooms are also on this floor, and consist of the radiographic dark room, a second one for print and slide-making, and a large drying room.

Massage and Electrotherapeutic Department.

The first floor is occupied by the electrotherapeutic department.

One large room is equipped as a gymnasium for remedial exercises. Adjoining the gymnasium are the two large male and female massage rooms. Massage couches are placed round the walls of the rooms, and above each couch is a wall type treatment board, fed from the 80 volt motor generator in the basement, from which both faradic and galvanic currents can be obtained. At intervals around each room are patresses with four non-interchangeable plug sockets, to each of which is led a different supply; 230 volts D.C. from the town mains; 200 volts 50 cycles from the motor generator; 80 volts D.C. from the small motor generator; and 4 volts D.C. from accumulators. Each room also contains a Schnee bath.

There are, in addition, several small treatment rooms. Three diathermy machines are provided, and a high-frequency apparatus. Three rooms are used for ultra-violet light therapy. Of these, two have carbon arcs, of which there are two in each room. The arcs take 30 ampères, and each pair is used in series on 230 volts D.C. The third room has two atmospheric mercury-vapour lamps. A hot and cold shower bath is provided for patients.

The radium department, also on this floor, has a waiting room, and a treatment room. A special safe, with very heavy lead protection, is used for the storage of the radium. The treatment room is provided with wash-basin, electric steriliser, &c.

There is also a photographic studio, for clinical photography, with a dark room next door.

The building was designed and its construction supervised from the beginning by Dr. J. M. Woodburn Morison, medical officer in charge of the department, and Mr. T. W. Turnbull, A.M.I.Struct.E., Master of Works, Royal Infirmary, Edinburgh. All the electric wiring and plumbing was carried out by the permanent staff of the infirmary. The entire X ray and electrotherapeutic equipment was supplied and installed by Messrs. Watson and Sons (Electro-Medical), Ltd. The approximate cost of the building and its equipment was £52,000.

MEDICINE AND THE LAW

Death after Vaccination.

ON Jan. 24th an inquest was held at Warrington touching the death of J. H. Chetter, a fitter's labourer employed by Joseph Crosfield and Sons, Ltd., soap and chemical manufacturers. A few weeks earlier there had been a local outbreak of small-pox. Two cases having occurred at the company's works, the management invited all employees to be vaccinated. While vaccination was optional, workmen who refused to be vaccinated were informed that they would be suspended from work for an indefinite period. The deceased man, though reluctant to be vaccinated, agreed to take this precaution rather than be suspended from his work. He was vaccinated on the 5th with four injections in his left arm. He continued at work until the 11th when, owing to the swollen condition of his arm and the pain he was suffering, he was sent home during the morning. On the 13th he visited his panel doctor and obtained a sick note. Three days later he visited the doctor again and was ordered

to bed. On that day and on the 18th the doctor saw him at his home. His condition grew worse; he could not open his mouth; tetanus was suspected, and he was removed to the Warrington Infirmary. He died on Jan. 20th, and, as the infirmary doctors were unable to assign a definite cause of death and considered that the vaccination might have been a contributory cause, Dr. E. E. Bowden, police surgeon, made a post-mortem examination and an inquest was held. The employers and relatives were informed that they could be professionally represented at the post-mortem examination, and Dr. Bowden's deposition stated that about 15 medical practitioners were present. His deposition concluded as follows: "It is hard to say that the vaccination accelerated death; he was not healthy; he was fatty." Dr. Bowden's post-mortem examination report was to the effect that externally the body was well nourished with a large amount of fat; the right leg showed scars of healed ulcers; on the left arm the vaccine scars appeared to be quite normal for the period (15 days) since vaccination; internally the organs of the abdomen were normal with a large amount of fat; the heart showed some fatty infiltration, but was otherwise normal; the brain showed vertical meningitis extending down the outer and medial surfaces of both hemispheres; there was no basal meningitis. Dr. Bowden's report gave meningitis as the cause of death, and the jury returned its verdict accordingly. Mr. Samuel Brighouse, an experienced coroner, rightly examined Dr. Bowden very carefully at the inquest as to whether the vaccination had hastened or contributed to the death, or whether death was in any shape or form in a great or small degree attributable to the vaccination. The witness was unable to answer in the affirmative and consequently the jury, under direction of the coroner, could hardly have given any other verdict than that of "Death from meningitis," as already mentioned.

Chemist's Successful Appeal.

A brief report in the *Times* describes the appeal of an Islington chemist from a conviction for selling liniment of turpentine which did not conform to the formula in the British Pharmacopœia. The Finsbury justices had convicted him of selling a drug which was not of the nature, substance, and quality demanded by the purchaser, and had inflicted a fine of £1. It was stated that the prescription employed by the chemist's assistant was that contained in the London Insurance Pharmacopœia, a compilation stated to be largely used by panel doctors. There had been no suggestion of fraud or dishonesty against the chemist, the prosecution being undertaken under the Sale of Food and Drugs Acts on the mere ground that the article sold did not correspond in its composition with the standard which the purchaser might be deemed to expect. The London Sessions Court on March 9th quashed the conviction and remitted the fine.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The Drain on the Insurance Fund.

THE evening papers are talking of "a crisis in National Health Insurance" or "drain on the Sickness Fund." This looks like the language of panic. Not long ago the talk was of gigantic surpluses and of "full steam ahead on additional benefits." Now the ready but somewhat too simple explanation offered is loose certification by insurance practitioners, or unscrupulous insistence of panel patients. Prof. Alexander Gray, the political economist, whose long experience in the Ministry of Health and as a Member of the Royal Commission entitle him to a serious hearing, has written a long and well-balanced letter to the *Scotsman* on "a grave crisis." He knows the complexity of the whole financial system of insurance too well to assign the whole drain on the funds to any single cause. Commenting on certain statements[1] by Dr. Vernon Davies in the recent House of Commons debate, Prof. Gray says:—

"Dr. Davies's view would apparently be that what we are now suffering from springs from an inherent vice in the panel system, that that system rewards the easy-going, the not over-conscientious, and the flabby. On that I may not express an opinion. But I think it is incumbent upon me to underline the gravity of the present position. The panel system, with free choice of doctor, represents in many respects the ideal, retaining so far as may be the essential features of private practice; but its operation calls on both sides for singular scrupulousness and high integrity. It ought not to be necessary to protest that efficient administration does not mean the refusal of just claims. No one desires that, nor would anyone scruple to give the insured person the benefit of any reasonable doubt. It is, however, tolerably clear that much more than that is involved, and that claims which ought not to be made are being certified and admitted. This, it must be remembered, constitutes an injury to all others who may in future be entitled to prefer a claim against the fund which is thus being improperly depleted."

Prof. Gray adds that the present serious drain on the insurance funds represents the gravest crisis that the insurance scheme has been called upon to face since it was launched in 1912, and that all those who desire to secure continuance of the panel system with its freedom and flexibility should realise the critical nature of the period lying immediately ahead—

"For assuredly no Government, of whatever political complexion, could tolerate a further increase in the claims rate without taking into consideration the efficacy of the administrative machinery, which makes possible such a continued and unexplained augmentation of the burden on the insurance funds. It is in the hope that worse things may be averted that I have ventured to address you."

Factors in Depletion.

So far as Scotland is concerned the reason for depletion are not very evident. For example, the expenditure on the drug fund does not keep pace with the expenditure on actual sickness. The medical referees are kept tolerably busy; but the percentage of their rejections does not differ very seriously from, say, 1925. The percentage of the "failed to appear" is pretty constant from year to year (1926 was, of course, exceptional for other reasons). If it be the case that the approved societies have lost confidence in the insurance practitioners' certificates, and if those practitioners themselves increasingly rely on the medical referees to certify "capacity," obviously the whole panel system is in some danger. The clash of public and private interest is bearing its evil fruit. The numbers sent to the referees may be due, not to increasing sickness but to this want of confidence. It is nonsense to think that a financial system that is at one moment overflowing with money is at the next in a state of "crisis." And we have to remember that, after all, a great part of the serious work that might and should have been covered by an insurance fund is done by the voluntary hospitals supported, largely, by the workers' voluntary levy. It is probable that, at least in the industrial areas, the continuance of unemployment is now, to a great extent, showing the results natural to impaired energies. In a time of relative dearth the organism cannot maintain the same tension as in the period of plenty and the margin of resistance is bound to lessen. But, however we look at it, the position is unsatisfactory. The present occasion seems to me a good one for initiating inquiry.

The Education Authorities Election.

The Scottish Local Education Authority candidatures are in full swing, and the tale of attendance at meetings is even more depressing than usual. Twenty years ago, in Edinburgh, medical examination and treatment of school-children attracted relatively large audiences, but this time all interest seems dead, and it is recorded that two candidates arranged a meeting to find that not a single elector appeared. What does this phenomenal indifference to local

[1] THE LANCET, Feb. 25th, p. 420.

government mean? In the counties the larger area may account for the smaller interest, but this is not true of the cities. Perhaps "proportional representation" is having an effect. There seems to be no mechanism for producing a sharp clash of opinion. One year, when a "religious" question had arisen in the Edinburgh School Board, the meetings were overflowing and 33 per cent. or so of the electorate voted—a record figure, I believe.

Are we to expect the elector's educational interest to awaken only in moments of creative reform? Are we to take the present indifference as a sign of the adequacy of the machine, or as a hint that the relatively "golden age" of the first quarter of the twentieth century is rapidly coming to an end? I remember vividly the first Scottish School Board election away back in 1872, when the State took over the work of the churches. Now the churches are concerned about union and, at least in some of the areas, the electors are quite unconcerned about education. On the other hand, a greater number of capable individuals all over Scotland are discussing education in all its phases with more vigour than I have ever known. Is the lethargy among the electors simply a phase of the moral and physical depletion following the war? or is our very imperfectly organised "democracy" capable only of mass interest when the question is outside the day's routine?

Candidature of Dr. James Kerr.

Dr. James Kerr, formerly of the London County Council (Education), who now resides in Edinburgh, is a candidate for the Edinburgh Local Education Authority. His unsurpassed record as a pioneer school medical officer gives him a very strong claim.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

What is Cell Research?

Dr. Michael Lenhossék, professor of anatomy and histology in the University of Budapest, recently delivered a lecture here in which he pointed out that the last two decades had brought about an almost epoch-making transformation in histological research. Purely morphological studies, carried out chiefly by means of fixation, hardening, and staining, have been supplemented by the science of experimental cytology and histology—the study of living cells and living tissues.

The progress made in this field, said Prof. Lenhossék, is due to a steady improvement in technique over a period of many years. Among the methods available are vital staining, micro-dissection, and micro-manipulation; but far more important than these is the cultivation of tissues, explantation, or bioculture. The study of cells and tissues in a "fresh" state could at one time be carried out only in the "surviving" period—i.e., in the short time which passes between their separation from the living organism and the first sign of decomposition. During this period the cells utilise their reserve energy, and although they sometimes reveal the phenomena of life, they are really dying. The pioneers of explantations conceived the idea of removing tissue elements from the living organism and keeping them alive, thus making possible their propagation, and in embyronic tissues their morphological development. Credit for the first successful experiments belongs to the American Harrison, professor of zoology at Yale, who made his pioneer investigations in 1904 at Bonn, in Germany, in the laboratory of the anatomist, Nussbaum. He placed the nerve sheath of the spinal cord of a young frog in clotted frog-lymph, and observed that the sheath, though removed from the living organism, not merely did not decompose, but even showed signs of development, inasmuch as new peripheral nerve-fibres grew out of it. This observation of Harrison's was of great importance, said Prof. Lenhossék, from the point of view of neurohistogenesis, but it was of still more importance in that it laid the foundations of explantation. At present research on these lines is conducted in almost every civilised country. It has been found that the cells and tissues of the embryo can be grown and propagated to an almost unlimited degree in suitable cultures, just as bacteria can be; and thus they are, in the strict sense of the term, immortal. All that is necessary is to supply them with adequate nourishment and see that metabolic products are removed.

Tissue culture, continued Prof. Lenhossék, affords a valuable means of investigating cancer; malignant cells can easily be cultivated in vitro, and meanwhile we are in a position to observe their different features. It has been shown that the cancer cells differ from other cells chiefly by their atypical metabolism, in consequence of which they are secreting particular enzymes; these ferments explain the destructive effects of cancer cells and their inroads into the adjacent tissues. If the culture medium were changed to correspond, ordinary cells also could be influenced in such a way that they would assume the features of cancer cells. By means of tissue culture it also has become possible directly to observe, under the microscope, the action of the different pathogenic bacteria upon living cells, and the reaction of the latter. By placing tubercle bacilli in a test-tube containing a culture of lymph nodes the process can be seen which takes place when tuberculosis bacilli are attacking the healthy tissues of a living organism, and the formation of tubercles, or destruction of the bacilli, can be followed step by step. Tissue culture is very important also from the point of view of pharmacology, because the action of the different drugs and poisons can conveniently be studied in living cells cultivated in vitro. Again, in connexion with regeneration by formation of scars and connective tissue, it has been possible by means of cultures to prove that the fibroblasts of the young connective tissues are formed from the leucocyte elements of the circulating blood. As a result of their experience with such methods some investigators doubt whether rigid discrimination is justifiable between the different varieties of cell (epithelial, connective tissue, muscle cells), and have started a theory that the cells are originally of one variety, and that the differences between them at a later stage depend entirely on the medium in which they find themselves. They support this view by pointing out that epithelial cells may, in a certain culture medium, assume the form and features of connective tissue. They acknowledge, however, that there are also unchangeable varieties of cell. It is to be hoped that this and other fundamental questions will soon be definitely solved with the help of tissue culture.

WESTMINSTER OPHTHALMIC HOSPITAL.—At the annual general meeting of the governors of the Royal Westminster Ophthalmic Hospital, the Earl of Arran announced that the new building will be opened for out-patients on April 10th, and that it is hoped to have the whole of the hospital in working order at the end of May or the first week in June.

LONDON LOCK HOSPITAL.—At the invitation of the board of management of the London Lock Hospital in the Harrow-road the Minister of Health has appointed a committee to inquire into the management and administration of the hospital. The committee consists of Sir John Eldon Bankes, chairman; Dr. John Fawcett, and Mrs. H. J. Tennant. The terms of reference are: "To inquire into the management, administration and staffing of the London Lock Hospital, with special reference to the arrangements for the medical treatment of the patients and to the provision made for the moral, social, and material welfare of the inmates." In May last 8 of the 13 members of the Ladies' Committee resigned, and in July the London County Council gave notice of their intention to reduce the annual grant to the hospital by £2000 a year. The chief complaint of the ladies who resigned was that the matron, assistant matron, and another member of the staff had been dismissed without consultation with the Ladies' Committee. They also claimed that women ought to be elected to the board of a women's hospital. The management is in the hands f the board which consists solely of men.

Correspondence.

"Audi alteram partem."

THE ASTHMA RESEARCH COUNCIL: AN APPEAL FOR FINANCIAL SUPPORT.

To the Editor of THE LANCET.

SIR,—The Asthma Research Council is preparing a public appeal for funds to carry out its object of increasing our knowledge of asthma and allied conditions. On the initiative of the Council a Medical Advisory Committee has been formed whose functions are to suggest what research work at present being pursued or projected should be supported by the Council, to indicate future lines of investigations, and to supervise such work.

The following preliminary suggestions have been made:—

(1) The formation of an asthma clinic at one or more hospitals, for the investigation of the "asthma-hay-fever-urticaria-syndrome."

(2) An investigation into the phenomena of sensitisation in relation to asthma.

(3) An investigation into the nature of the asthmatic attack, from the physiological standpoint.

(4) An investigation into the relationship of asthma to general respiratory diseases.

(5) An investigation into the family histories of asthmatic and allied conditions.

(6) An investigation into the nature of alleged "cures." This would include the continuation of the work of the British and American Medical Associations in investigating secret remedies.

(7) The provision of whole or part-time research scholarships and grants in aid for such investigations and for others being carried out or projected by general practitioners, medical centres or research institutions, throughout the Empire, which are approved by the Medical Advisory Committee.

(8) The appointment, from time to time, of travelling investigators to visit foreign clinics where investigations into asthma or allied conditions are being undertaken.

(9) The publication of any useful results obtained.

In order to carry out these schemes the Asthma Research Council hopes to raise a fund of £50,000, and the Medical Advisory Committee trusts that members of the medical profession will assist by bringing to the notice of their patients—especially of their asthmatic patients—the aims of the Council and its need of support.

Subscriptions should be forwarded to the Westminster Bank, Ltd., Covent Garden, W.C. 2.

(Signed)—

ARTHUR F. HURST, Guy's Hospital (*Chairman*).
R. J. S. MCDOWALL, King's College (*Vice-Chairman*).
H. W. BARBER, Guy's Hospital.
L. S. T. BURRELL, Brompton Hospital.
E. C. DODDS, Middlesex Hospital.
J. FREEMAN, St. Mary's Hospital.
R. D. GILLESPIE, Guy's Hospital.
V. E. NEGUS, King's College Hospital.
S. GILBERT SCOTT, London Hospital.
T. T. JEANS, Surg. Rear-Admiral (Ret.).
(*Hon. Secretary*).

March 12th, 1928.

CONGENITAL HYPERTROPHIC STENOSIS OF THE PYLORUS.

To the Editor of THE LANCET.

SIR,—The question whether these cases should be treated by medical measures alone or by surgical operation is one which is still unsettled. The relative rarity of the condition and the difficulty of getting groups of cases which are exactly comparable has hitherto prevented its solution statistically. The factor which controls the surgical mortality above all else is the early recognition of the disease followed by immediate operation. This I pointed out in a recent paper[1] based on 90 cases of the disease all treated by operation in the same institution. Of this group 15 were "private" cases and had suffered from vomiting on the average for 13 days—all recovered. The remaining 75 were "hospital" cases, and had an average duration of symptoms in fatal cases of 25 days; in these, the mortality was 48 per cent.

By whatever method the cases are treated, all observers have noted that the private case has a lower mortality than the hospital case; the earlier diagnosis in the private case appears to be the true explanation. Last year at the Birmingham Children's Hospital 44 cases of the disease were admitted; of these, 28 were operated upon with a mortality of 17·8 per cent., and 15 were treated medically with a mortality of 46·6 per cent. One case was moribund on admission and has not been included in either group. No selection of cases was made. In some units of the hospital all cases were operated on, in others, all were treated medically; in one case only was operation refused—the moribund case mentioned above which died within 24 hours of admission.

The interest of these figures lies, I think, in the fact that the two groups were drawn from the same geographical area and are therefore exactly comparable. The disease is relatively rare and appears to be rather unevenly recognised in various parts of the country. If this is so, then the mortality of the disease will vary with the source from which the cases are drawn, and will tend to diminish in any neighbourhood where recognition and early treatment becomes the rule. This improvement has been very noticeable in the area from which the Birmingham Children's Hospital draws its cases, for the surgical mortality has diminished from 40 per cent. in a group of 90 cases operated on in the years 1919–26, to 18 per cent. in 28 cases in 1927. Earlier recognition may be expected to diminish the mortality still further seeing that included in the above figures there were 21 "private" cases all operated on by the Rammstedt method and treated in the same institution with only one death, a mortality of under 5 per cent.

I am, Sir, yours faithfully,

Birmingham, March 8th, 1928. SEYMOUR BARLING.

COLONIC SPASM IN DIVERTICULITIS.

To the Editor of THE LANCET.

SIR,—In his Modern Treatment article last week, Mr. Gordon Bryan might have emphasised even more than he does the factor of spasm of the colon in diverticulitis, especially in those cases associated with stenosis. A few weeks ago I was asked to see an old lady of 80, in whom a progressively increasing constipation had been developing over a period of some six months. For three or four weeks she had not had a proper motion; the infrequent evacuations consisted of a few inadequate "rabbit droppings." When I saw her, she had for six days passed nothing by the rectum save occasional flatus; the abdomen was distended, and she was just beginning to feel a little nausea. Examination of the abdomen revealed a descending colon which could be felt as a very hard and moderately tender cord. A bismuth enema had, ten days previously, shown typical diverticula in the descending colon and the sigmoid.

I suggested dosing her with belladonna until symptoms of poisoning developed. She was given, therefore, 15 minims of the tincture every two hours, and watched carefully. In addition, an ounce of warm olive oil was carefully introduced into the rectum every four hours. She had been in the habit of taking liquid paraffin by mouth, and this was continued. In twelve hours she passed a good motion, and for the next three days she continued to pass a large quantity of fæces. Now she is living an ordinary, vigorous social life. Occasionally constipation threatens, but so far it has always been controlled by a return for a short time to smaller doses of belladonna.

[1] THE LANCET, Sept. 3rd, 1927, p. 492.

Spasm of the colon is very apt to develop in any condition of irritation or inflammation of the large bowel; and it is perhaps not enough recognised how large a part unsuitable diet plays in the maintenance of this condition. Especially does this seem to be the case when for various reasons imperfectly digested meat fibre reaches the large bowel, there to undergo putrefaction, with the production of offensive alkaline stools. It would appear that the products of the protein putrefaction may themselves irritate the large bowel; at all events, in many cases the forbidding of meat or fish, and the institution of a lacto-vegetarian diet (vegetables or fruit being given en purée) over a period of several weeks, produce even without the aid of drugs most satisfactory results.

Enemata in cases of diverticulitis should be regarded as somewhat dangerous weapons. In the first case of this disease which I ever saw, a "good enema" had been given—so good that it had evidently gone through one of the weak points of the gut wall, into the abdomen.—I am, Sir, yours faithfully,

Liverpool, March 10th, 1928. ROBERT COOPE.

GASTRO-DUODENAL ULCERATION.

To the Editor of THE LANCET.

SIR,—In your issue of March 10th your three correspondents appear to think that I am not in favour of the intensive alkaline treatment of gastro-duodenal ulceration. But I have used it continuously since 1919 and have written and spoken about its excellent results on numerous occasions. My advocacy of the treatment did not, however, prevent me from feeling distressed when one of my patients died in coma from alkalosis or from feeling satisfied when the recognition of the early symptoms—depression, anorexia, headaches, and nausea—in seven other cases may have saved them from a similar fate. Several deaths have been reported in America, and it is absurd for Dr. Cameron to speak about my "theory of alkalosis," or for Prof. MacLean and his colleagues to regard it as a "theoretical condition," simply because they have been fortunate so far in not seeing a similar case. It is admittedly rare, my eight cases representing about 2 per cent. in some 350 treated by this method.

Investigations are being carried out at Guy's Hospital and New Lodge Clinic with the object of eliminating the danger, and it is for this reason that it is important to study by modern physico-chemical and biochemical methods the effects of the different alkalis, though Prof. MacLean apparently thinks that such investigations are waste of time—a curious view for the director of a professorial unit. So far as we have gone, we believe that alkalosis can be prevented without any diminution in the favourable effect of the treatment by avoiding sodium bicarbonate and magnesium oxide and carbonate, all of which have the further disadvantage of stimulating the secretion of gastric juice after they have neutralised the acid present in the stomach at the moment of administration. If sodium citrate is given with each feed and the triple phosphates of magnesium and calcium (in proportions depending upon the state of the bowels) are given in powder form, the contents of the stomach can be kept permanently neutral, as we have been able to demonstrate by examining fractions taken at intervals throughout the day. The dose of alkali required is greatly reduced if the feeds are given hourly instead of two-hourly. It is difficult to see why Prof. MacLean advocated the use of bismuth oxycarbonate in his paper, as he now states that he realised that it does not act as an alkali under the conditions present in the stomach; or why he only referred to the anti-clotting effect of sodium citrate, although he knew that it was one of the most potent factors in the alkaline treatment he described.

American writers have laid great stress on the importance of pyloric obstruction and renal disease in connexion with alkalosis, but on looking into the details of the eight cases we have seen at New Lodge Clinic, I find that only one had any pyloric obstruction and only one any definite renal disorder. All the others had normal urine, a normal cardiovascular system and normal blood pressure, but two had a slight excess of blood-urea. In every case the blood-urea was much raised, though the urine remained normal, when the first symptoms appeared, this being doubtless a result and not the cause of the alkalosis, as it fell rapidly when the treatment was discontinued.

Dr. Geoffrey Fildes states that it was assumed in the paper written by himself and his colleagues that "the present-day practitioner was sufficiently conversant with modern practice not to overlook such an obvious possibility of trouble" as oral sepsis. The fact remains, however, that, as I pointed out in my last letter, about 70 per cent. of the cases sent to the Clinic were found on expert dental examination to have oral sepsis.—I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, Berks, March 12th, 1928.

NEWSPAPER INSURANCE FROM A MEDICO-LEGAL POINT OF VIEW.

To the Editor of THE LANCET.

SIR,—When, recently, two London daily newspapers with a huge combined circulation (*Daily Mail* and *Daily Express*) decided to extend their free accident insurance benefits to include £100 for every fatal accident, it must have given some food for thought to many a medical practitioner. Was the fatal illness of to-day to become the fatal accident of to-morrow? After 20 years of the Workmen's Compensation Act, cases are still being fought out in the courts as to "what is an accident." In one case that went to the House of Lords it was laid down that "it might be just as serious to be hit in the eye by a single microbe as by a cricket ball." Newspaper insurance opens up a similar vista of difficulties. The strain of opening or closing a window on a person with a diseased heart might well be called an accident, especially if £100 depended upon the terminology used. The registrar of deaths or the coroner would probably have to use discretion in the matter.

I have recently been interested in "falling out of window" cases. They would appear to be on the increase. They occur in all sorts of places, hotels, institutions, private residences, and offices. In several cases an "open verdict" has to be returned owing to lack of evidence. Taken as a class, they might be the result of—murder, manslaughter, suicide, misadventure, accident, or sudden illness. A man might drop dead in a room beside an open window. If in doing so he happened to fall out of the window on to the ground below, it would be a difficult point to decide or prove the exact cause of death. It has no parallel to the case of a dead body thrown into the river to simulate drowning.

Newspaper insurance may add yet another responsibility on the already over-burdened medical practitioner.—I am, Sir, yours faithfully,

Old Broad-street, E.C., March 12th. J. J. SCANLAN.

DISPOSAL OF THE DEAD.

To the Editor of THE LANCET.

SIR,—The education of the public towards the ideal of cremation is slow, but it should not be difficult to instil into its mind at the present moment, when the conception of the ideal of health is developing, that the dead are unclean and dangerous; that handling and kissing a body is revolting; that a "nice corpse" is an abomination, and not a thing to be made much of by friends and relations. In our temperate climate rapid putrefaction does not usually occur, and this tends to the belief that there is no danger in a body remaining in a house for a period up to a week. While it is difficult to prove that this danger exists, I think it is safe to assume it,

especially in view of the fact that the mouth and nose cannot be effectually closed, and that the earliest putrefaction occurs in the upper air passages.

There are two methods, I suggest, by which this danger could be averted. First, removal of the body within 24 hours to chapels attached to undertakers' premises, where refrigerating plant could be installed under the bier. Secondly, sanitation of the body within 24 hours. By this I do not mean embalmment, but a simple and rapid replacement of the blood in the main vessels by a formalin or other antiseptic solution. I consider that the medical practitioner should definitely advise this in all cases where death has occurred through specific infectious fevers, pneumonia, malignant disease, cardiac disease, nephritis, and in any disease where dropsy has occurred; and point out to the relatives that he advises this in order to protect the living.

One or other of these methods should be used whether the body is to be cremated or buried. Too elaborate sanitation is not indicated, as it would tend to prolong the time in which the body resolves itself into its natural elements. Both these methods, but particularly the latter, would effectually lay that unnecessary bogy "premature burial," and this would be of great assistance to those to whom the idea of burial alive is a very real fear. I do not think that it would take many years to instil these ideas into the public, and I think that they should come primarily from the medical profession.

I am, Sir, yours faithfully,

C. BERKELEY WAY, M.B., B.S. Lond.

Finchley-road, N.W., March 9th, 1928.

FACIAL PAIN IN PULMONARY DISEASE.

To the Editor of THE LANCET.

SIR,—A case of pulmonary abscess associated with pain referred to the face was reported in your columns last week by Dr. R. C. Hutchinson and Prof. J. S. B. Stopford. The absence of any reference by the authors to the work of Sir Henry Head on referred pain in visceral disease suggests that a masterly contribution to clinical medicine is less well known than it deserves to be. This may be explained by the fact that it is now over thirty years since it was published in *Brain* (1893, p. 1; 1894, p. 339; 1896, p. 153). These three papers, however, are of such far-reaching importance, both for the diagnosis of visceral disease and for the correct interpretation of pain, that no clinician can afford to leave them unread.

With regard to referred pain in pulmonary disease, Sir Henry Head showed that, as in the case of other intra-thoracic and intra-abdominal viscera, disease of the lungs may produce referred pain in two areas, one on the body and one on the head. In disease of the pulmonary apex these areas lie in the third and fourth cervical segmental areas, and the nose and the middle part of the forehead. These are the situations of the pain in the case reported by Dr. Hutchinson and Prof. Stopford, in which the abscess was situated in the upper lobe of the left lung. Sir Henry Head's interpretation of the reference of pain to the head and face in visceral disease is based upon Gaskell's observation that the vagus and the glossopharyngeal nerves represent the visceral branches of a set of nerves whose somatic sensory roots are to be found in the sensory portion of the trigeminal. He suggests that the impulses referred to the area of the fifth nerve reach the brain by the vagus.

This explanation, if correct, would account for the occurrence of referred pain in the case reported, in spite of the fact that the phrenic nerve had previously been resected. Moreover, it seems a more likely hypothesis than that a close relationship exists between the trigeminal and the phrenic.

I am, Sir, yours faithfully,

London, W., March 13th, 1928. W. RUSSELL BRAIN.

Mental Breakdown in Adolescence.—In Dr. J. B. Strafford Lewis's letter which appeared in our correspondence columns last week the word in the fifteenth line, twice printed "determination," should read "deterioration."

Obituary.

HENRY WILLIAM LANGLEY BROWNE, O.B.E., M.D. BIRM., F.R.C.S. EDIN., LL.D. TORONTO.

Dr. Langley Browne, whose death took place at Birmingham on March 7th in his eightieth year, was held in high regard as a practitioner throughout the Black Country, and among his colleagues as one who cared much for the advancement of medical knowledge and prestige.

Henry William Langley Browne was born at Bishop Auckland, Co. Durham, on Nov. 28th, 1848, the son of Dr. Benjamin Stocks Browne. Soon after his birth his father, who had only qualified in 1844, removed to West Bromwich, where he practised during the remainder of his life. The son went to school at Edgbaston and Sydenham College, going on to his clinical study in Birmingham hospitals, and qualifying M.R.C.S. in 1870 and L.R.C.P. Edin. a year later. Immediately on qualification he joined his father in practice, adding another 50 years to the family connexion with West Bromwich. He soon obtained an appointment on the staff of the local hospital, to which he was attached for nearly 30 years, and becoming interested in surgical technique he communicated a number of articles to the medical papers on ligature of arteries, appliances for bloodless operations, and various types of industrial emergency. About this time he was appointed surgeon to the Great Western Railway, and was also acting as medical officer to the G.W.R. Provident Society. Though very busy as a practitioner in these and other directions, he found time to take the F.R.C.S. Edin. and all the medical degrees granted by the newly formed University of Birmingham. He also became an active member of the Birmingham and District General Medical Practitioners' Union, serving on its executive and ultimately presiding over its counsels. In 1893 he was elected to represent the Midland Counties branch on the Council of the British Medical Association, of which in turn he was chairman from 1906–08. At other periods he was president of the Midland Medical Society and of the Association of Factory Surgeons. In 1901 he was elected a member of the Council of the Medical Defence Union, giving valued assistance in that capacity until his election as a Direct Representative on the General Medical Council in 1906 compelled him to resign; he was returned at the head of the poll then and again at the general election in 1911, sitting on the Council until 1920. During his period of office he presided over the Unqualified Practice Prevention Committee set up by the Council in 1907, and his hand was seen in admirable reports presented to the Council by that committee in 1908 and 1911.

DR. LANGLEY BROWNE.

The first report, made with the coöperation of the officers of the Council and of many official bodies, included a digest of the laws in force within the British Empire and in foreign countries designed to restrict medical practice by other than legally qualified persons, and was followed by a supplementary statement from Dr. A. G. Bateman, the late secretary of the Medical Defence Union, drawn up from the Statutes of the different provinces in Canada and of the different American States. The report formed an admirable synopsis of the professional status of medicine in the civilised world, and in submitting it to the Council Dr. Langley Browne moved that "as the present Acts did not sufficiently enable persons requiring medical aid to distinguish qualified from unqualified practitioners the Government should be requested to take steps for the appointment of a Royal Commission to inquire into the evil effects of unrestricted medical practice by the unqualified. The motion was agreed to, and the substance of the report and the attitude of the General Medical Council received wide commendation. Although no Royal Commission was appointed, there is no doubt that Dr. Langley Browne's report focused public as well as medical attention upon weaknesses in the existing Medical Acts.

During the period of the war, though in the late sixties, Dr. Langley Browne took charge of the Churchfield Red Cross Hospital at West Bromwich, and placed his intimate knowledge of general practice and practitioners at the service of the Central Medical War Committee. Two years later he retired finally from practice as the result of an accident which deprived him of his eyesight, but not of his continued interest in medical affairs.

One of his colleagues writes of Langley Browne as a man of high principles who vigorously opposed all unethical practices. No one in the district was held in higher respect or more thoroughly deserved the confidence of professional colleagues, and his enforced withdrawal from active work was deplored by a wide circle of medical friends and patients.

Dr. Langley Browne was a life member of the governing body of Birmingham University and a justice of the peace for the county of Stafford. Toronto University made him a hon. LL.D. He married Gertrude, daughter of R. Heckels, of Sunderland, by whom he had one daughter.

THE photograph of the late Dr. James Wheatley, which was reproduced in an obituary notice last week, was the copyright of Messrs. Elliott and Fry, Ltd.

Public Health Services.

REPORTS OF SCOTTISH MENTAL HOSPITALS.

THE 1927 reports of the *Aberdeen* and *Glengall* mental hospitals have reached us with commendable promptitude, following by only a short time the 1926 reports of some other institutions. On the last day of 1927 there were 799 patients on the *Aberdeen* register, including 44 voluntary boarders, one of them rate-aided. The recovery-rate for the year was 31·67 per cent. and the death-rate 8·21 per cent., a reduction on the average for the past 30 years. Six of the 65 deaths were due to general paralysis and 12 to phthisis. The malarial treatment has proved satisfactory, and protein shock therapy has also been tried for general paralysis. Ninety-two patients had ultra-violet rays from a mercury-vapour lamp and all gained in weight. Some of the melancholic patients improved mentally. The dentist treated 162 patients, and reports that he found a marked improvement in oral conditions compared with the previous year. Diathermy gave gratifying results in cases of sciatica and lumbago. 102 patients were examined for diagnosis under the new X ray plant, and a high-frequency apparatus has just been installed. The occupational therapy department has been enlarged, and two handlooms are to be set up. A detached pavilion is being erected for female tuberculous patients.

There were 602 patients in the *Glengall Hospital, Ayr*, on Dec. 31st, 1927, of whom 11 were voluntary boarders. In 20 per cent. of the cases admitted the mental disorder was associated with some form of serious bodily illness, and 40 per cent. of the admissions were in a precarious state of health. Nearly two-thirds were free from hereditary taint as far as the histories could be relied on—a figure which must bring the admissions very nearly into line with the general population. The recovery-rate was 27 per cent. for men and 34 per cent. for women, a decline which reflects the large number of incurable cases admitted. The death-rate was 12 per cent. and autopsies were held on 64 patients. The phthisis-rate was high and a number of inmates died from general paralysis. The general health was good. Parole is allowed freely, and parties are sent to cinemas, concerts, and football matches. The Visiting Commissioner comments on the free homely atmosphere of the wards and the excellent arrangements for classification, with absence of noise and restlessness. Only 136 of the patients were unemployed at the time of his visit. Five nurses and one attendant gained their R.M.P.A. certificate during the year, bringing the total certificated up to 44 per cent. of the women and 40 per cent. of the men.

The *Roxburgh* District Board of Control had 366 patients resident in their asylum at the end of the financial year 1927, an increase of ten. Of the six voluntary boarders admitted during the year one was rate-aided. The recovery-rate was 34·4 per cent., a figure which is kept low by the apparently increasing practice of sending senile persons to the institution—a practice against which the medical superintendent protests strongly. The death-rate was 7·6 per cent., and autopsies were held in 17 cases. A small epidemic of influenza in the spring caused no serious anxiety. A visiting dentist started work during the summer. Two new verandahs are greatly benefiting newly admitted patients. The Commissioners note that a commendable attention is paid to the idiosyncrasies of individual patients in the matter of diet.

The *Stirling* District Board of Control report a steady increase in the numbers of patients at the *Larbert Mental Hospital*. The total number under the Board's supervision at the end of the financial year 1927 was 1226, of whom 897 were in the institution. Of all those admitted only 32 were classed as being in average health. Twenty-three were suffering from senile insanity, 15 from general paralysis, and 8 were mentally defective. Twenty voluntary patients were admitted during the year, of whom nine were rate-supported, so that the Stirling parish councils appear to be more up to date in their views than other parts of Scotland. The medical superintendent points out that, as no grant has been paid in respect of a certified patient since 1916, the parish councils lose nothing by sending voluntary patients to mental hospitals. The recovery-rate was 37·43 per cent. One of the men discharged had been a melancholic for 12 years. Eight patients were sent out on trial and only two had to return. The death-rate was 9·4 per cent., the lowest for some years. A post-mortem examination was held in every instance where permission was granted. General paralysis was the cause of death in 17 cases and phthisis in seven. Enteric caused anxiety in the spring, but otherwise the general health was good. No carriers were found. New patients are admitted to verandah beds in the reception hospital, and the method is found highly satisfactory. Sixty-eight patients were treated by the electrical installation, and many derived benefit from Schnee baths, high frequency, and artificial sunlight. A tungsten arc has now been provided for local treatments. The visiting dentist saw 215 patients during the year, and reports that very few of the recent cases show healthy mouths. An occupational therapy department has been started, and rug-making, raffia, and basket-work are taught. The old admission hospital has been turned into an open-door home for convalescent

and parole patients, and is greatly appreciated. Chronic industrial patients are now accommodated in another separate block, and a third takes the sick and infirm, with a department for the tuberculous and one for epileptics and troublesome patients. Most of the milk for the institution comes from the home farm, and new byres are to be erected. 3086 eggs were provided during the year from the poultry farm, and the gardens, while showing a balance of £1076, provided all the vegetables and flowers needed. Fifty-four members of the nursing staff hold their certificate, ten of whom passed the final during the year.

The *Inverness* District Asylum housed 723 patients at the half year 1927, an increase of 17 on the previous year. The recovery-rate was 26·3 per cent. and the death-rate 9·5 per cent. Phthisis and senile decay accounted between them for 47 per cent. of the fatal cases. Autopsies were performed in eight instances. During the year 15 patients were sent out on trial. Only 16 of the 141 who have now gone home on probation have had to return to the hospital. There was an influenza epidemic in March, but otherwise the general health was good. Many of the male patients work in the garden and farm, and the supply of milk, potatoes, and vegetables has been adequate for the needs of the institution. Eight nurses and one attendant gained their certificate during the year.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 3RD, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 365 (last week 392); scarlet fever, 1711; diphtheria, 1481; enteric fever, 28; pneumonia, 1572; puerperal fever, 37; puerperal pyrexia, 114; cerebro-spinal fever, 14; acute poliomyelitis, 6; acute polio-encephalitis, 2; encephalitis lethargica, 33; dysentery, 9; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified from the following 25 counties:—London, 2; Bedford, 1; Berks, 1; Cambridge, 1; Chester, 4; Derby, 13; Durham, 83; Gloucester, 2; Hertford, 1; Lancaster, 38; Leicester, 1; Lincoln, parts of Lindsey, 2; Norfolk, 1; Northumberland, 10; Nottingham, 12; Oxford, 1; Southampton, 1; Stafford, 4; Suffolk East, 1; Warwick, 14; Yorks, North Riding, 9; West Riding, 74; Brecknock, 1; Glamorgan, 44; Monmouth, 44.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on March 6th–7th was as follows:—Small-pox, 11; scarlet fever, 1682; diphtheria, 2615; enteric fever, 28; measles, 1460; whooping-cough, 155; puerperal fever, 13 (plus 11 babies); encephalitis lethargica, 71; poliomyelitis, 1; "other diseases," 31. At St. Margaret's Hospital there were 15 cases of marasmus, 12 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was 1 death from small-pox, 2 (0) from enteric fever, 167 (89) from measles, 4 (1) from scarlet fever, 41 (16) from whooping-cough, 47 (10) from diphtheria, 51 (7) from diarrhœa and enteritis under two years, and 93 (21) from influenza. The figures in parentheses are those for London itself. The deaths from enteric fever outside London were reported from Bristol and Warrington. Of the 78 fatal cases of measles outside London, 19 were reported from Plymouth, 12 from Sheffield, 7 from Manchester, 6 from Derby, 5 from West Ham, 4 each from Bristol and Worcester, while the figures from Glasgow and Dublin for the same week were 15 and 10 respectively.

Small-pox Deaths.—We learn from Dr. W. Campbell Lyons, medical officer of health for South Shields, that since Feb. 21st four deaths of small-pox patients have been reported in the county borough, the particulars of which are as follow:—

1. A woman, aged 30, vaccinated in infancy, was notified as a small-pox case on Feb. 21st and removed to hospital on that day. Onset Feb. 14th, rash Feb. 20th. On admission to hospital her temperature was 100°F., about four hours later it was 103°, and at the time of her death, about 6 A.M. on Feb. 22nd, it was 107°. The death was certified as: (1) ulcerative endocarditis, (2) small-pox.

2. A female infant, born prematurely (7–8 months) on Feb. 4th, admitted to hospital on Feb. 25th, rash Feb. 24th. Onset unknown: unvaccinated; died on March 1st. Death certified as: (1) premature birth, (2) small-pox.

3. A woman, aged 66, notified as small-pox and removed to hospital on March 3rd. Onset Feb. 28th (?), rash March 3rd: supposed to have been vaccinated in infancy, but marks not apparent. She was in frail health and as the home circumstances were very bad she was removed only after careful medical examination. She died six hours after admission to hospital. The cause of death was certified as: (1) senility or debility, (2) small-pox.

4. A boy of 6 years, unvaccinated, died on March 4th, before any notification of the disease had reached the department. Onset Feb. 28th, rash March 4th. From an examination of the body the assistant M.O.H. formed the opinion that the case was one of small-pox, of hæmorrhagic type, and the private medical attendant has given a certificate in these terms.

In regard to the death from small-pox reported from Bradford in the return for the week ended Feb. 25th, we understand from Dr. J. J. Buchan that the patient was a man of 54 admitted to the Bradford small-pox hospital from outside the district. On admission to the hospital he was suffering from hemiplegia and diabetes, with diabetic gangrene of the toes, and Dr. Buchan adds that, in his opinion, small-pox was a factor of small contributory importance to his death. He had been vaccinated in infancy.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. A. de B. Joyce to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: D. G. Evans, D. C. Scott, W. E. K. Coles, J. E. Brooks, W. J. Robertson, D. Fettes, E. Underhill, W. G. D. McCall, R. F. Walker, L. M. Rowlette, M. B. King, H. S. Moore, L. S. C. Roche, and B. L. Davis.

C. V. D. Rose, late Flight Lt., the R.A.F. Med. Serv., to be Capt.

ARMY RESERVE OF OFFICERS.

Maj. G. Baillie, having attained the age-limit of liability to recall, ceases to belong to the Res. of Off.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. W. Boyd resigns his commn.

TERRITORIAL ARMY.

Maj. J. Allan, having attained the age-limit, is retd., and retains his rank, with permission to wear the prescribed uniform.

Lt. C. M. Bradley to be Capt.

INDIAN MEDICAL SERVICE APPOINTMENTS.

A certain number of appointments to permanent commissions in His Majesty's Indian Medical Service will be shortly made. Full particulars may be obtained from the Military Department of the India Office, Whitehall, S.W.

SMALL-POX LEAVE RESTRICTIONS.

A Fleet Order has been issued recapitulating the restrictions on leave of officers and men proceeding to any town or district in which an outbreak of small-pox has been notified. In the November list 25 towns and districts were mentioned. These places now number 58. The recent additions embrace Abercarn U.D. (Mon.), Birmingham C.B. (Warwick), Clayton U.D. (Yorks), Felling U.D. (Durham), Foleshill U.D. (Warwick), Kiveton Park R.D. (Yorks), Sheffield C.B. (Yorks), and Spennymoor U.D. (Durham).

DEATHS IN THE SERVICES.

Colonel Sir Robert Neil Campbell, I.M.S. (retd.), who died at Lahore on Feb. 18th at the age of 73, was educated at the Edinburgh Institution and at the University of Edinburgh. He joined the Indian Medical Service in 1877, and served in the Naga Hills Expedition of 1879–80 (mentioned in dispatches and medal), and also in the Akha Expedition of 1883–84 (mentioned in dispatches). He then served as Civil Surgeon at various stations in Bengal, and received the Kaisar-i-Hind gold medal in 1900. In 1909 he was appointed Inspector-General of Civil Hospitals in Eastern Bengal and Assam, and on the reconstitution of Bengal was gazetted to Assam as Inspector-General of Civil Hospitals and Prisons and Sanitary Commissioner.

Col. Campbell, who retired in 1914, had charge of two of the hospitals established at Brighton during the war for Indian soldiers. He received the C.I.E. in 1909, the C.B. in 1912, and the K.C.M.G. in 1917.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Invaliding in the Royal Navy.

On March 7th Sir BERTRAM FALLE in a logical speech moved that the rules by which disability from disease is attributable to or is aggravated by service in the Navy should be re-examined, as well as the manner in which those rules are interpreted. He pointed out that the percentage of rejections among intending recruits is so high as to show that the naval ratings are the pick of the country, while at the same time removal from the Service for tuberculosis is frequent. This he considered could only be accounted for by the unhygienic nature of the employment, especially the sleeping facilities. The Survey Board in charge of the removals found themselves able to hold that tuberculosis was attributable to or aggravated by occupation in but a small number of cases—the percentage, he admitted, had gradually risen from 3 and 4 per cent. to 10 per cent.; but considering the circumstances of recruiting he held that the percentage should be much higher, while he pointed out that discharge without admission of liability, where the term of service had been less than ten years, would mean deprivation of pension. Sir Bertram Falle, while disclaiming any intention to belittle the medical profession, considered that a purely medical Survey Board, such as has existed since 1914, does not work so well as the previous arrangement whereby the president of the Board had to be a Captain R.N. (executive) for the ratings did not place the same confidence in the decisions. He held that a Board of Appeal should be granted both to rank and ratings before discharge for tuberculosis. Rear-Admiral BEAMISH, in seconding the motion, confirmed Sir Bertram Falle's view of the dissatisfaction existing, and pointed out that the rate of tuberculosis among the naval ratings is higher than that in the Army or in the civilian population, and was higher among the ratings than among those of officer's rank. He cited from personal experience facts to show that disease could only too easily be acquired during service in the Royal Navy, and he urged that the existing rules should be looked into, so that the State might get a clear idea of its responsibilities in the matter. Some method of insurance, perhaps on a contributory basis, might meet the circumstances. Mr. AMMON associated the Labour Party with the motion, and pointed to the remarkable diminution of tuberculosis in the post-office as showing what might be done. Dr. VERNON DAVIES informed the House how tuberculosis differed from certain other pathological conditions, when assessing the measure of disability or aggravation entailed by occupation was in question. He pointed out the practical difficulties involved, and indicated that a scheme of compulsory insurance for the Service against tuberculosis might meet the difficulties. Lady ASTOR joined in Sir Bertram Falle's contention that there should be a right of appeal from the decisions of the Survey, but the House was "counted" before a division was reached. It is felt by all parties that men invalided from the Navy should have all the circumstances closely scrutinised, and the subject should engage the attention of the House again at an early opportunity.

Army Estimates.

On March 8th Sir L. WORTHINGTON-EVANS (Secretary of State for War), in moving "That Mr. Speaker do now leave the Chair on the House going into Committee on the Army Estimates, 1928," said that this year he was asking on Vote A for 153,500 men, or 13,000 less than last year. Economies had been made in the administrative services, principally in the Royal Army Service Corps and the Royal Army Medical Corps. The total amount which he was asking the House to vote was £41,050,000, or a net decrease of £515,000, as compared with last year. But owing to other causes the true saving to the Exchequer was £1,000,000.

Mr. LAWSON said that there was a very significant fact which was worthy of the attention of the House, the War Office, and the country generally. It was that 84,000 recruits offered themselves last year, and out of that total about 28,000 were accepted as meeting the standard of physical fitness required for Army purposes. They had to put that side by side with the fact that the Secretary for War had stated that the Army was below standard, and that there was need for further men. He asked the House to consider what must be the real state of affairs among the civilian population if they saw a continually increasing standard of physical fitness demanded in regard to men who offered themselves for service. Last year the proportion accepted was 35 per cent., compared with 33 per cent. this year. Coming as he did from the homes of the masses of the people he said that there was very little hope in view of the present standard of life of an improvement in that direction during the next few years.

The motion "That Mr. Speaker do leave the Chair" was agreed to, and the House went into Committee of Supply on the Vote for men.

Unqualified Dispensers.

Sir WILFRED SUGDEN said a conference sat in 1920 comprising representatives of the technical officers of the War Office who carried the responsibility of the supervision of unskilled dispensers employed in hospitals and delegates from the great body of organised pharmacists. That conference considered the proposals of the skilled men who were willing to undertake the responsibility of dispensing in the Army, the field hospitals, and in the home hospitals of drugs and other necessities. But nothing was done to utilise all this expert knowledge which was patriotically offered to the defensive forces of the Crown, and particularly to the Army. The Navy utilised the services of the skilled pharmacists to the full, and every country in Europe followed the same practice. The first suggestion made to the conference in question was that there should be a commissioned officer in charge of every accredited military hospital in the country. It was contended that there should be three commissioned officers for a certain area in London. Next it was proposed that there should be given full facilities for the unqualified dispensers who had been operating under medical supervision to qualify. The pharmacists were prepared to give special facilities for these men to acquire the necessary education to deal with this important work. The recommendations of that conference had never been accepted in the slightest degree by the Army Council or by the Secretary of State, although the representatives of the Army Council and the Secretary of State had accepted those resolutions unanimously. It was agreed by the conference that the appointment of these pharmacists would be an economical arrangement. The War Office at the present time were buying their necessary compounds already prepared, but if these could be made up under the control and supervision of trained pharmacists there would be on the market prices of the 12 or 13 standard compounds which were necessary in the military hospitals of this country a saving of from 50 to 70 per cent. of the cost. If it was contended that economy through the utilisation of unskilled labour in the hospitals was perfectly covered and made fool-proof by medical supervision, he wished to say that while paying his full quota of respect to the medical profession it was impossible for them to control and guide and prevent any error that might arise in dispensing and at the same time to secure cheapness in the product. He had obtained from the University of Cambridge details of the necessary qualifications of a man trained in chemistry in 1913 and also in 1927, and when he compared the training given to the medical profession in pharmacy with that which was called for in the case of certificated pharmacists he said that it was impossible for the medical profession, while at the same time acting as physicians and surgeons, to give the necessary guidance to unskilled men in administering and dispensing medicines. Either the medical or the pharmacist work must suffer. While criminals and civilians could demand that their medicine should be mixed by trained chemists, and while lunatics were treated in the same way, the ordinary soldier had his "number nines" prepared by those who were untrained for the work. They only asked that there should be not less than one commissioned pharmacist, possibly of senior rank, supported by an officer of junior rank in each Army hospital at home and abroad with a senior commissioned pharmacist officer at the War Office. If that was not possible then an officer of senior rank should operate under the medical officers in each hospital at home and abroad.

Mr. KIRKWOOD moved to reduce the vote by 50,000 men.

Reduced Strength of the R.A.M.C.

Sir RICHARD LUCE said that he did not approve of the reduction of the vote, but he wished to raise several points in regard to the Royal Army Medical Corps. First, there was a reduction in the estimates this year in the establishment of that Corps of 22 officers and 284 men. That was out of an establishment of 4163, a reduction of about 6·8 per cent. The reduction in the rest of the establishment of the Army was only about 1000 out of an establishment of about 140,000, or about 0·7 per cent. This was only one-tenth of the percentage by which the Royal Army Medical Corps was to be reduced. It was mentioned in the estimates that this reduction was due to the closing down of certain hospitals and a recent review of the number of equipped beds maintained in military hospitals. He had no objection to the reduction of hospitals where that could be effected, or to a coördination of hospitals where that could be done between one service and another, as had been done to some extent in the last year or two. He was one of those who believed that the medical services of the Army, Navy, and Air Force would be benefited by the amalgamation of those services; but the reduction of hospitals must not be the criterion of

the establishment of the Royal Army Medical Corps. If the strength of that Corps were to depend solely upon the number of beds, and if the duty of the medical service were merely to look after the sick of the Army in peace-time, a much better system than the present one could be devised. Why should they have men of the Royal Army Medical Corps doing duty in military hospitals at all? Such work would be infinitely better done by women nurses and sisters. The duty to be done in these hospitals was the training of the male personnel for duty in war, and that duty could not be done by women, for it was largely work in the field, although they knew how much work women did in the late war close to the front. Therefore the establishment of the Royal Army Medical Corps must not be allowed to be based on the actual beds that were required in hospitals in peace-time. The proportion of men needed by the Corps as compared with other branches of the Service was based on the experience of many years going back to the beginning of last century. Time after time as wars had come there had been difficulties, because in the intervals between those wars, through undue economy, the medical services had been reduced below the level of safety and efficiency, and this had rendered them incapable of doing their work in time of war. The work of the Royal Army Medical Corps in the last war showed what had been gained by experience in previous wars, and the Corps rose nobly to the occasion. There was practically no serious breakdown in any part which had to be worked by that Corps, although there was a partial breakdown in Mesopotamia where the medical work fell on a branch of the Service—the Indian Medical Service—which had been starved in peace-time. At the end of the war the Corps had been proved and was not found wanting, but since then with the cry for economy there had been a perpetual and constant whittling down of the Service. In 1923–24 there was a reduction of over 300 men; a year before a reduction of 63; and this year there was another reduction of 300 officers and men. There was an idea that medical service could be improvised in war-time out of civilian medical men. That was not a fact. Anyone who had had experience in the Great War realised that where they had to deal with officers and men who had not received an administrative training in medical work for war it took them a long time before they achieved anything like the state of efficiency which was attained by Regular officers. There were many branches of the medical service which were not the same in peace as in war. Medical sanitation was a complete service of its own, and required a different knowledge and experience from that acquired in peace-time. If reductions in the cost of the Army were necessary and reductions in the medical services were made, they ought to be in proportion to the reductions in the other services.

The Upkeep of Military Hospitals.

In Vote 10 there was a sum of £69,000 for new buildings at the various hospitals throughout the Empire—all very necessary improvements and additions to the hospitals, but it was to their upkeep that he wished to call attention. It was impossible from the Estimates to see how much of the £1,314,000 which was to be devoted to the upkeep of military buildings was to be devoted to hospitals. Last year circumstances took him to the great hospital at Netley. One could not go to that hospital with its great traditions founded as it was in that wave of military medical ardour after the Crimean War on the most beautiful site of Southampton Water, and see it as it was now without a sense of depression and gloom, and without feeling that they were not doing their duty to the sick soldiers in peace-time. Netley was the largest military hospital, and it was specially devoted to men invalided from overseas. They went there to find it in an atmosphere of gloom, a lack of paint and a lack of care, the grounds allowed to go to rack and ruin, and this was in a place where everything might be the very best possible. He appealed to the Secretary of State to look into this matter of the upkeep of the hospitals. It would do a vast amount of good if the right hon. gentleman would visit them, and perhaps before doing so he might visit a good voluntary hospital and compare the difference of atmosphere. A year or two ago one of the greatest authorities on hospitals in this country said in his hearing—not with reference to military hospitals, but with regard to other State hospitals—that as long as a department was connected with the State bare duty might be done, but no grace would be added to that duty and there never could be a heart-beat in a Government department. They did not want that to be said of the military hospitals. He did not think it was so in war-time, but since then things had been drifting in such a way that they were not very far from that statement being true in regard to the military hospitals.

New Candidates for the R.A.M.C.

There was also the important point of the failure to keep up the establishment of the medical officers in the Service. He knew that that was an extremely difficult point, and it was not at all easy to say why the Service failed to attract duly qualified men at the present time. Looking at it from a fair point of view he could not say that the pay of the Royal Army Medical Corps was insufficient, but the fact remained that there were not enough candidates coming forward and the Service was lacking in efficiency on that account. He thought that one of the chief causes was the feeling in the Service that it was a service that was being reduced and one which had not the sort of permanency necessary to keep up a feeling of esprit de corps. The constant reduction of strength and therefore the increase of work, was causing unrest among those who were already serving, and making them unwilling to get other men to join. He had felt it his duty to warn the Secretary of State against allowing this Service to go downhill by reason of a series of piecemeal reductions. The medical officers and their heads in the Army had not got the weight of power behind them to stand up for their particular share of the available money in the Estimates as had other departments. It was the duty of someone to bring to the notice of the Government and the country the fact that they were not getting their fair share, and that they were likely to be reduced below a state of efficiency. They had no direct representative on the Army Council, but only shared one with a very large number of other branches of the Service, and therefore they could never make their position known in the same way as if they had a representative of their own. If in years to come another war took place and the medical services were found unprepared or incomplete, the country would call out for blood as it had done on other occasions. Somebody would have to be made the scapegoat. Whoever it might be the chances were that the scapegoat would not be the Secretary of State of that time or any other Minister, but the heads of the medical departments would have to bear the brunt of the responsibility for what was being done now in piecemeal reductions of the Service. He therefore urged that while reductions and economies must be carried out, their application in a service so essential as the medical service should be in proportion to the reductions of other branches of the Service.

The Power of Expansion.

Lieut.-Colonel FREMANTLE said he wished to support what had been said by Sir Richard Luce in regard to the medical services. He thought that the medical members of the House could rightly plead for an extension of services in some directions, because they had supported economies in other services. On several occasions during the last nine years he and other medical Members had urged the futility of keeping up general hospitals for both the Army and the Navy in peace time at the same place. After several years, and following the reports of various committees, they had at last seen the reduction of these general hospitals one by one. It was a very difficult matter, and had to be done very cautiously and carefully in order that there might be no permanent damage, and that they might still have the power of expansion in case of need. But there was still room for further economy in that direction, and it was in that sense that the medical Members of the House urged the Government to continue on that line of economy. They felt, however, perturbed when economies were made in the machinery for expansion in case of need. The medical services consisted of two parts. The greater part consisted of physicians and surgeons—the tactical part which could to some extent, especially in connexion with the Territorial Army, be improvised in case of war. He meant that it could be imported from the civilian services. But there was the other part, the administrative part, the nucleus of each unit, which could not be so imported unless it had been trained. It had been suggested that the establishment of the Territorial Army must be cut down in peace-time, including the medical service, and despite representations from himself and his colleagues in the House the number of field ambulances to a Territorial division was cut down from three to one. That was a very serious thing. It meant that when the Territorial Army mobilised again expansion would be difficult. The reduction, he maintained, was excessive. The personnel of the Territorial Army medical services was down by one-third of its full strength. In the Regular Army they had still the difficulty of recruiting. A list published in the *Times* showed that they had managed at last to get 15 medical officers, as compared with the 60 that were required. They could not possibly support an army in the field unless they had an adequate supply of medical officers trained for their work. He urged the Government to pursue the work of securing recruits for the medical service. The real difficulty was not simply the question of pay, but the fact that the men now in the Service were overworked abroad, and instead of getting leave they were constantly kept at work beyond their time, the senior men being relied on to do comparatively junior work because there were no junior officers in the Service, and they were deprived of a great deal of their family life when they were getting towards the end of their service. These men did not give a good name to the Service

at home, and that made it all the more difficult to get the junior men. The medical service was a key service to the human machine, and it was essential to maintain these key services at the highest pitch.

The Soldier's Teeth.

Mr. MITCHELL BANKS said that whether the soldier's job was right or wrong nobody since the days of Homer had any doubts as to the value of the doctor. The soldier had three vulnerable points—his toes, his tummy, and his teeth. He thought that every doctor would agree that many of the intestinal complaints which soldiers suffered in India and Mesopotamia could have been prevented if only the teeth of the men could have been better looked after. He hoped that the Secretary for War when he was considering the medical aspect of the Army would not forget that unless they gave the soldier adequate teeth with which to consume his very healthy rations he was certain to fall a victim to rheumatism or to stomachic complaints.

Can the Medical Services be made more Attractive?

Dr. VERNON DAVIES said that he wished to associate himself with the speech of Sir W. Sugden in respect to pharmacists in the Army. The authorities at the War Office had taken the very definite position that the soldier in the British Army could be competently looked after by dispensers who had a small amount of training in the compounding and mixing of drugs, and they thought that the training of these men was sufficient to enable them to look after the medical needs of the soldiers. They might be right, but the Navy did not agree with them. The National Health Insurance administration under the Ministry of Health insisted that anyone who dispensed for the civil population must be a trained pharmacist. The Home Office had decided that prisoners in gaols must have their medicines dispensed by trained pharmacists. The War Office was alone in the attitude which they had adopted on this matter. If the War Office were right they should simply scrap all the pharmacists in the Navy, prison service, and National Insurance organisation and get the work done by cheap dispensers. If, on the other hand, the War Office was wrong, they might perhaps some day be inclined to consider the advisability of coming into line with the other services of the country. An army without an efficient medical service was of no use whatever. Had the Secretary of State done anything to see if that service could be made more attractive to medical men? Unless the War Office tackled this question seriously they would get into difficulties. The War Office had to remember that they were competing with panel practice and with all the public medical appointments in the country. When a young medical man soon after he had qualified could go into public medical service and work five days a week for £700 or £750 a year he had no definite inducement to go into the Army. A short service in the Army with either an increased gratuity at the end of the seven years, or preferably with retired pay, giving the War Office a call upon him at any time, would increase the popularity of the Service. If it could be arranged that any medical man who had served in the Army should have preferential treatment in applying for any State or municipal medical appointments that would make the Service still more popular.

Reply to the Debate.

Sir LAMING WORTHINGTON-EVANS, replying to points raised in the debate, said that to-day the dentist in the Army was not received with scoffs and scorn, but with open arms. There were 337 dentists and their assistants, and so well were they thought of that 16 had been added to their number in the course of the year. With regard to the pharmacists in the Army, the War Office had accepted some of the recommendations of the Committee which inquired into the matter. The recommendations which they were unable to accept would have involved a great deal of extra expense. The Government were of opinion that dispensing in the Army was carried out adequately and economically so far as the needs of the Army in peace were concerned. The Royal Army Medical Corps dispensers received adequate training for the work which they were called upon to do. As regarded the question of the Royal Army Medical Corps which had been raised by Sir Richard Luce and Colonel Fremantle, the reduction in that Corps was due to the closing of military hospitals in Cosham, Devonport, and Chatham, and there was therefore a reduction in the number of equipped beds required. Owing to a closer coöperation with the Navy, military patients were now in certain cases treated at naval hospitals. The Committee which had been working on this question had enabled them to reduce the number of patients, and that accounted for the reduction of 22 officers and 271 other ranks. As a matter of fact, although that reduction appeared in the estimates, some of that medical personnel had gone to China and were carried on the supplementary estimate. Nevertheless, it was a reduction which was inevitable. In regard to the military hospitals, he (Sir L. Worthington-Evans) had visited most of the big hospitals in England, and he did not know how it could be said that the Government were doing only their bare duty if the hospitals were good and were looking after the patients properly. Sir R. Luce had complained of the gloomy atmosphere of these hospitals and of the absence of paint. That really was not the test of a hospital; the real test was the medical service, and even the social service which the patients received in those hospitals, and his experience of the Army hospitals he had visited was that they were not gloomy, that it was a great deal more than the bare duty which was being done, and that real human attention was being given to men who seemed happy in the hospitals and content with the treatment which they were given there. Sir R. Luce seemed to suggest that the medical service was treated as a Cinderella service, that cuts were made in it out of proportion to the cuts made on the rest of the Army. That was really not quite the position. In these estimates out of a total of £41,000,000, £2,400,000 was being devoted to the medical services. Unfortunately it was true that they had not the number of doctors who were required for their establishment. They had done their best to make the Service attractive. He had conferred with his medical advisers and with the medical societies, and he thought now at any rate the terms and conditions of service were agreeable to the medical profession. He had had the endorsement of the medical profession. The short service which had been referred to he brought in two years ago. Men could now join for seven years, and if they then wished to retire—it was optional—they had a gratuity of £1000. Of course his hon. friend wanted more. He wished he could give the Service more, but let him not say £1000 was nothing. It was a very useful addition to the capital of a young medical man who was about to set up in practice. As to the grievance that the Army Medical Service were not directly represented on the Army Council, every branch of the Service could not be directly represented on the Army Council when there were only four military members on the Council. But the Director-General of Medical Services had direct access to the Secretary of State at any time without having to go through any military superior.

The motion to reduce the vote was rejected by 189 votes to 20.

HOUSE OF COMMONS.

THURSDAY, MARCH 8TH.

Lunacy Administration.

Mr. FREDERICK ROBERTS asked the Minister of Health what amount had been expended on lunacy administration in the last year for which statistics were available; how many certifications took place during the same period: and how many people were discharged.—Mr. CHAMBERLAIN replied: The expenditure of local authorities in England and Wales on lunacy administration for the financial year 1926–27 amounted to £7,803,804. During the same period loans were sanctioned for capital expenditure amounting to £242,335. During the calendar year 1927 the certifications and discharges were as follows:—

	Certifications.	Discharges.
Public mental hospitals ..	20,474	9,823
Other institutions and single care	1,419	892
Total	21,893	10,715

Anthrax Statistics.

Dr. VERNON DAVIES asked the Home Secretary the number of cases of anthrax in this country for the last three years for which statistics were available and the origin of infection in each case.—Sir WILLIAM JOYNSON-HICKS replied: I can give only the figures for cases of anthrax reported in factories and other premises under the Factory and Workshop Acts in the years 1925 to 1927. The principal figures in the table give the number of cases; the figures in parentheses give the number of deaths.

Origin of infection.	1925.	1926.	1927.	Total.
Wool and hair (other than horsehair) ..	26 (5)	16 (2)	18 (1)	60 (8)
Horsehair or bristles ..	3 (2)	8 (1)	3 (1)	14 (4)
Hides and skins ..	18 (3)	15 (1)	13 (1)	46 (5)
Other*	1	3	1	5
Total	48 (10)	42 (4)	35 (3)	125 (17)

* The suspected materials in these cases were: feathers, 1; bones, 1; felt or tanned leather, 1; refuse from animal products, 1; not ascertained, 1; total, 5.

Factory Inspection in Scotland.

Mr. BUCHANAN asked the Home Secretary if he was aware that in a large number of factories situated in the West of Scotland particularly employing young female labour factory inspectors rarely, if ever, paid a visit; and what steps he was prepared to take to secure safety by having proper inspection made.—Sir W. JOYNSON-HICKS replied: The hon. Member exaggerates the position. I am informed that out of 157 factories in the West of Scotland employing young girls which were not inspected last year, 86 had been visited within a period of 15 months, and all but six of them within two years. I have repeatedly stated that I am not satisfied with the present strength of the factory inspectorate, and that I propose to set up a committee to examine the question. As the committee would have to take account of the new situation created by the Factories Bill, I had not contemplated appointing it until the Bill had been passed. I am very anxious, however, particularly as the Bill has been postponed till next year, that no time should be lost, and I am proposing to advance the commencement of this inquiry and proceed with the appointment of the committee in the autumn.

Importation of Dangerous Drugs.

Mr. DAY asked the Home Secretary whether his attention had been called to the remarks of the coroner at a Kensington inquest on Mrs. Ida Mary Gropper, in which he stated that he was strongly of the opinion that legislation should be introduced for the purpose of restricting the import of the French hypnotic drug known as dial; and whether he proposed to take any action in the matter.—Sir WILLIAM JOYNSON-HICKS replied: Yes, Sir. The question of the need for further restrictions in the case of certain kinds of drugs has been brought before the Inter-departmental Committee which has been examining the law relating to poisons. I will see that the circumstances of the case to which the question refers are brought to the attention of the Committee.

MONDAY, MARCH 12TH.

Royal Air Force Hospitals.

Dr. VERNON DAVIES asked the Secretary of State for Air if he would give a full list of Royal Air Force hospitals at home and abroad, the number of beds in each hospital, and the personnel attached to each hospital.—Sir S. HOARE replied: The following is the information requested:—

Locality of the R.A.F. hospitals.	Equipped beds.	Hospital personnel.		
		Officers.	Nurses.	Airmen.
Home—				
Halton	309	9	38	98
Cranwell	100	6	12	41
Uxbridge	31	4	9	10
Iraq—				
Hinaidi	200	10	23	75
Basrah	35	5	7	24
Palestine—				
Sarafand	77	5	6	35

This statement is based on the present establishment, which is now under review. It should be added, first, that the hospitals in Iraq and Palestine provide for British Army officers serving with the local ground forces in these countries, and for certain British civil officials in addition to the Royal Air Force; and, secondly, that the personnel attached to most of them also perform duties apart from the duties directly connected with the respective hospitals—e.g., the officers at the Cranwell Hospital are also medical officers for the Cranwell Command as a whole. The Indian sections of the hospitals in Iraq are excluded.

Experiments on Living Animals.

Mr. NEIL MACLEAN asked the Home Secretary whether he had caused any inquiry to be made as to the large increase in the number of experiments performed on living animals and, if so, whether any reason had been given for such an increase; and, if no inquiry had been made by his department, whether he would institute one.—Sir WILLIAM JOYNSON-HICKS replied: The increase referred to is mainly in inoculations, feeding experiments, and similar procedures; and I understand that it is due principally to the development of medical science in regard to the standardising of drugs and the investigation of vitamins, and to the steps taken to safeguard the purity of the milk-supply. I see no ground for any special inquiry.

TUESDAY, MARCH 13TH.

Temporary Commissions in the R.A.M.C.

Mr. BARNES asked the Secretary of State for War whether ex-Service men were disqualified for appointment to a temporary commission in the Royal Army Medical Corps if they were in receipt of a disability award.—Sir L. WORTHINGTON-EVANS replied: The fact that an ex-Service man is in receipt of a disability award is not in itself a disqualification for appointment to a temporary commission in the Royal Army Medical Corps, but such cases have naturally to be considered very carefully in view both of the possibility of aggravating the disability and of the danger of the officer's breakdown in the performance of his duties.

Pension Awards.

Mr. WALTER BAKER asked the Minister of Pensions the number of first awards of pension to fresh applicants during 1927, and the number of conditional awards current on Jan. 1st, 1928.—Lieut.-Colonel G. F. STANLEY (Parliamentary Secretary to the Ministry of Pensions) replied: The total number of first awards of all kinds made in the calendar year 1927 was 4355. On Jan. 1st, 1928, there were about 8500 officers and nurses and 146,000 men in receipt of conditional awards in respect of disablement arising out of service in the Great War.

Treatment of Scottish Disabled Pensioners.

Dr. SHIELS asked the Minister of Pensions (1) how many disabled pensioners there were in Scotland, and what was the average number for the last three years of disabled or affected men without pension who had attended the Ministry centres for treatment; (2) how many men in Scotland last year received home treatment with allowances, and what was the total number of hospital beds in Scotland which the Ministry considers adequate; and (3) how many Scottish disabled men were being treated in England; what were the numbers for the respective diseases or conditions; and where were the places of treatment.—Lieut.-Colonel G. F. STANLEY replied: The total number of disabled officers, nurses, and men in receipt of pension or other grant from the Ministry in Scotland is approximately 43,000. The average number of patients attending at Ministry clinics in Scotland and in receipt of in-patient treatment in each of the last three years was as follows:—

	Clinics.	Ministry Hospitals.
1925	960	.. 600
1926	610	.. 495
1927	425	.. 365

1484 disabled men received treatment at home together with allowances during the year 1927. The Ministry has in view hospital accommodation in Scotland for current needs of about 400 beds, which will provide a substantial reserve. In view of the decline in the requirements of hospital treatment, I am unable to estimate what accommodation may ultimately be found to be necessary; 105 Scottish disabled men are under treatment in Ministry hospitals in England. Of these 99 are in four hospitals—viz., Harrowby, Orpington, Cosham, and Maghull—which have been established for the treatment of special forms and degrees of nervous disease, including epilepsy, and six are medical and surgical cases receiving special treatment in Mossley Hill (1), Sidcup (2), and Rochampton (3) hospitals.

Use of Emulsifiers in Cream.

Mr. LAMB asked the Minister of Health (1) whether his attention had been drawn to the increasing use of emulsifiers for the reconstitution of cream as a result of the enforcement of the Public Health (Preservatives, &c., in Food) Regulations; how many prosecutions had taken place in cases of the fraudulent sale of the synthetic article as cream; and what further steps, if any, were contemplated by his department with a view to the suppression of the practice; and (2) whether he regarded synthetic cream as a foodstuff for the purposes of the Public Health (Preservatives, &c., in Food) Regulations; and what steps, if any, had been taken by his department to deal with the sale, as cream, of the synthetic article containing preservative.—Sir KINGSLEY WOOD replied: My right hon. friend's attention has been drawn to the increasing use of emulsifiers for the reconstitution of cream, but it does not seem likely that the Preservatives Regulations are responsible for the increase. I would point out that the prohibition of preservatives applies equally to natural and to reconstituted cream. A more probable explanation can be found in the fact that the latter article is said to be prepared at a cost much lower than that of the former. I am unable to state how many prosecutions have been instituted by the local authorities in respect of the sale of the synthetic article as cream. As my hon. friend is probably aware, the constituents of cream can be emulsified so as to produce an article which is very similar to natural cream. Investigations are, however, being made as to the possibility of distinguishing between the two articles by scientific methods. Pending the completion of these investigations, I am not in a position to indicate what further steps can be taken by my department

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the College held on March 8th the diploma of Fellow was conferred on Joseph T. Fathi (London Hospital).

Diplomas in Tropical Medicine and Hygiene were conferred (jointly with the Royal College of Physicians) upon the following candidates, who have studied for the diploma at the London School of Hygiene and Tropical Medicine:—

C. R. Amies, Mary N. Andrews, R. E. Barrett, A. Bearblock, S. Bergsma, A. Dunlop, H. Fairbairn, Elisabeth Farra, H. A. Fawcett, M. M. Fihri, O. M. Francis, W. E. Giblin, H. K. Giffen, H. H. Gilbert, J. C. P. Grey, Alma B. Harvey, Eva Ho Tung, W. A. M. Jack, D. R. Jandial, B. M. Johns, R. S. Johnston, E. B. Jones, Margaret E. Lovett, Margaret M. McDowall, A. A. M. Magraby, R. C. Mahajan, M. V. Merchant, J. C. Milne, J. H. Oonvala, Thaliakattu Parukutti Ammal, J. R. Pierre, E. W. Reece, J. D. Reynolds, Enid A. Robertson, G. I. Shaw, T. A. Sherwin, G. A. Sloan, Hilda M. Smith, A. E. M. Soliman, Grace M. L. Summerhayes, V. E. Whitman, N. J. Willans, C. H. Williams, H. M. Willoughby.

Licences in Dental Surgery were conferred upon the undermentioned candidates:—

W. J. M. Allan and B. Cohen, Guy's; N. L. Craddock and G. S. Cubitt, Royal Dental; A. H. Curtis, Guy's; R. D. Daly, London; Cicely M. Finnemore, Royal Dental; R. P. Graham, Birmingham; L. E. James, Guy's; C. L. Noble, London; V. R. Preen, Guy's; W. I. Robertson, King's Coll.; L. R. Rowlands; M. A. Rushton, and C. J. C. Siggers, Guy's; E. Slack, Manchester; C. L. Stevens, Guy's; F. W. Threlfall, Univ. Coll.; H. C. J. Van den Brocque, Guy's; and J. Winter, Royal Dental.

UNIVERSITY OF LONDON.—Prof. Robert Robinson, F.R.S., has been appointed as from August 1st, 1928, to the University Chair of Organic Chemistry, tenable at University College.—Dr. J. B. Christopherson has been appointed examiner in tropical medicine for the year 1928 in place of the late Sir Percy Bassett-Smith.—Sir Wilmot Herringham has resigned his Membership of the Senate as one of the representatives of the Royal College of Physicians of London. In view of the forthcoming reconstitution of the University, the College does not propose to fill the vacancy.

The ceremony of Presentation Day will this year be held at the Albert Hall on Wednesday, May 9th, at 3 P.M. A Graduation Dinner will be held on the same day at 8 P.M. at the Grocers' Hall, Princess-street, E.C. Requests for tickets may be made to Mr. V. E. Wall, University of London, South Kensington, S.W. 7.

Applications for the University Chair of Biochemistry, tenable at the London School of Hygiene and Tropical Medicine, must be made in proper form to the Academic Registrar not later than April 11th.—A Carpenter medal, together with a money prize, will be awarded in 1928 for a thesis in statistical, genetic, comparative or experimental psychology, including the functions of the central nervous system and special senses, for which a doctor's degree other than Ph.D. degree has been awarded within three years ending May 31st, 1928.—The Senate will shortly consider grants from the Dixon Fund, which are allotted annually to assist scientific investigation. Grants will also be made from the Thomas Smythe Hughes Medical Research Fund, whilst applications are invited for the Laura De Saliceto studentship for the advancement of cancer research of the value of £150 a year. Particulars of these funds may be had from the Academic Registrar.

The election of Beit Fellows will take place on or about July 16th. Candidates must be under the age of 25, and not more than three Fellowships, of the annual value of £250, will be awarded. Applications must be received before April 20th on forms to be obtained by letter only from the Rector, Imperial College, South Kensington, S.W. 7.

At its meeting on Feb. 22nd the Senate approved a number of amendments to the regulations for the Diploma of Nursing.

THE LONDON HOSPITAL: QUINQUENNIAL APPEAL.—At the quarterly meeting of the House Committee, Lord Knutsford, the chairman, stated that his quinquennial appeal had, so far, produced a little over £44,000, £20,000 of which was the result of his broadcast appeal. During the past year there was a slight decrease in the number of patients treated; the average residence of the 16,000 in-patients was 15 days. The patients admitted contributed £32,075, an increase of £3368, chiefly due to the spread of the Hospital Saving Association.

ROYAL INSTITUTION.—On Thursday, March 22nd, at 5.15 P.M., Group-Captain Martin Flack will give the first of two lectures on Physiological Aspects of Flying.

BRITISH ORTHOPÆDIC ASSOCIATION.—The Robert Jones Medal and Association Prize for 1927 has been awarded to Mr. J. F. Brailsford for an essay on Deformities of the Lumbo-sacral Region of the Spine.

ST. ANDREW'S HOSPITAL, DOLLIS HILL.—The annual report shows that during the year there was an average of 58 patients daily in residence in the hospital, which is intended for the professional and middle classes. As there are only 52 regular beds, emergency accommodation had to be supplied. The hospital is trying to raise £15,000 at once towards the £30,000 required for a new building, which will include a children's ward.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Monday, March 19th, at 5 P.M., Prof. F. Langmead will deliver a lecture at the Medical Society of London, 11, Chandos-street, Cavendish-square, on Dull and Backward Children. On Thursday, March 22nd, at 5 P.M., Prof. Louise McIlroy will give a lecture-demonstration at the Royal Free Hospital, and on the same date, at 6.30 P.M., Mr. Theodore Just will give a demonstration at the Golden-square Throat Hospital. The lecture and demonstrations are open to members of the medical profession without fee. From March 19th, for a week, an intensive course will be given at the Hospital for Consumption and Diseases of the Chest, Brompton, and from the same date for a fortnight, an all-day course will be given at the Royal National Orthopædic Hospital. A course for the general practitioner will be given from the same date to March 30th at the Hampstead General Hospital, from 4.30 to 6 P.M., the instruction including a demonstration or lecturette in medicine, surgery, and the specialties. No special courses will take place between March 31st and April 16th owing to the Easter Holidays. Information, syllabuses of special and general courses, tickets, and copies of the *Post-Graduate Medical Journal* may be had from the Secretary of the Fellowship, at 1, Wimpole-street, London, W.

HEALTH AND CLEANLINESS COUNCIL.—On March 9th the Council held its annual meeting at the Hotel Cecil. The proceedings, which dealt with the aims of the Council and the extension of its work of assisting health activities by providing books, pamphlets, posters, lecturers, and cinematograph films, were held in private between lunch and tea, after which were shown some of the films which the Council lends without charge to bodies with similar objects. Dr. Andrew Balfour, proposing the health of the Council at lunch, said that the old Scots saying, "The clartier the cosier," had been changed by the pioneer public health work of this country to "The dirtier the deadlier," and that a man who lived under dirty conditions was a danger not only to himself but to others. Fortunately the truth of that axiom was more apparent in tropical countries nowadays than in our own, but if anyone should think that all was well in England he had only to look at the state of some London streets. It was, he said, a little beyond a joke when foreign students at his school came and said: "You are always telling us about the necessity for cleanliness in the tropics: England is the cradle of hygiene; will you come out and look at some of the back streets here and see how they are?" Another possible field for the Council's activities was the sanitary provision for workmen engaged on the many new buildings that were being erected in the city; until representations had been made the sanitation in the new School of Tropical Medicine itself would have left much to be desired. Americans who came to this country interested in hygiene matters were shocked at the way in which our food was handled. In spite of numerous committees and reports, food was exposed where it should not be exposed. Fortunately there were not many flies, or there would be a worse tale to tell. Dirt led not only to danger, but to a lowering of the moral tone, and he looked to the Council to combat the tendency towards decadence in these matters. On the bright side Dr. Balfour quoted from an article in the *Journal of the American Medical Association* on typhoid in some of the largest European cities. No other country but this, he read, could show so long a list of large cities free from a single typhoid death, and our freedom from this disease was a fine testimony to the work of the public health service in this country. The new activities of the service, such as those against tuberculosis and venereal disease, should not be allowed to push cleanliness into the background, and it was fortunate that a Council such as this existed to guide the people upon proper lines. Dr. G. F. Buchan, the President, outlined the objects of the Council, and each member of the party received a sample of its educational books, a work entitled Health and Cleanliness, a Text-book for Teachers.

ST. MARK'S HOSPITAL.—At the annual meeting on March 8th the Lord Mayor of London announced that the number of beds at this hospital had been increased to 72, and that an up-to-date cancer research laboratory had been provided. Last year 583 patients were admitted to the wards, and 6440 out-patients attended.

UNIVERSITY OF HONG-KONG.—At a congregation held on Jan. 9th the degree of M.D. was conferred on D. K. Pillai, and the degrees of M.B., B.S. upon 17 candidates. Under the Medical Act, 1886, degrees conferred by this University are registrable in the Colonial List of the Medical Register.

OXFORD OPHTHALMOLOGICAL CONGRESS.—The eighteenth annual meeting of this Congress will be held at Keble College from July 4th to 7th. On July 5th there will be a symposium on the Ultra-violet Ray, introduced by Dr. Leonard Hill, F.R.S., followed by Mr. W. S. Duke-Elder, and others. The Doyne Memorial Lecture will be delivered on July 6th by Prof. Arthur Thomson, his subject being Observations on the Eyes of Birds. Further information may be had from the Hon. Secretary, Mr. Bernard Cridland, Salisbury House, Wolverhampton.

NEUROLOGY AND PSYCHIATRY: COURSES AT VIENNA.—Systematic post-graduate classes in neurology and psychiatry will be held in English at the Neuropsychiatric Clinic of Prof. Wagner-Jauregg and the Neurological Institute of Prof. Marburg at Vienna University under the auspices of the American Medical Association of Vienna, from June 1st to July 31st. The fee will be $214 and the class will consist of not less than 8 and not more than 15 members. Further information may be had from Docent Dr. E. Spiegel, Vienna, I., Falkestrasse 3.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—We are informed that hospitals situated within 11 miles of St. Paul's desiring to participate in the grants made by the Fund for 1928 must apply before March 31st to the hon. secretaries of the Fund at 7, Walbrook, E.C. 4 (G.P.O. Box. 465A). Applications will also be considered from convalescent homes which are situated within the above area or which take a large proportion of patients from London.

JEWISH HOSPITAL FOR LIVERPOOL.—Negotiations between the Liverpool Jewish Hospital Committee and the existing hospitals for the setting aside of two wards for Jewish patients have failed. It has therefore been decided to found an independent establishment, it having been decided that the setting aside of two wards, with the supply of special food, would be practically as expensive as a separate institution. The new hospital will have 20 beds and a kosher kitchen. An offer to defray the cost of the beds has already been received.

BRITISH MEDICAL ASSOCIATION: SCHOLARSHIPS AND GRANTS IN AID OF SCIENTIFIC RESEARCH.—The Council of the B.M.A. will receive applications as follows:—

Research Scholarships.—An Ernest Hart Memorial Scholarship of £200 per annum, and three other research scholarships of £150 per annum are offered to candidates undertaking research in any subject (including State medicine) relating to the causation, prevention or treatment of disease. Each is tenable for one year, commencing on Oct. 1st, 1928. A scholar may be reappointed for not more than two additional terms, may hold a junior appointment at a university, medical school, or hospital, provided its duties do not interfere with his work as a scholar.

Grants.—The Council will also receive applications for grants for the assistance of research in the same directions, preference being given to applicants who propose to investigate problems directly related to practical medicine.

Applications for scholarships and grants should be made on the prescribed form (to be had from the Medical Secretary, B.M.A. House, Tavistock-square, London, W.C. 1) before June 2nd.

THE LANCET: SUBSCRIPTION RATES.

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	Six Months	1	1	0
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	Six Months	1	5	0
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Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, March 20th.—5.30 P.M., SPECIAL GENERAL MEETING OF FELLOWS. 8.30 P.M., PATHOLOGY. Election of Officers and Council. Communications: Cuthbert Dukes: Some Observations on Pyuria. S. P. Bedson and J. Bland: Cross Immunity Between Vaccinia and Herpes Virus. J. H. Orr and W. A. Campbell: The Action of Welchii Toxin on Red Cells in Vitro. Demonstrations: R. W. Scarff: Carcino-sarcoma of Œsophagus. Myelin Kidney.

THURSDAY.—8.30 P.M., UROLOGY. Discussion on the Treatment of Stricture by Excision. Opener: Mr. Frank Kidd.

FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.) Cases will be shown. 8 P.M., EPIDEMIOLOGY Paper: Dr. C. O. Stallybrass: Season and Disease.

CHELSEA CLINICAL SOCIETY.

TUESDAY, March 20th.—8.30 P.M. (at the Hotel Rembrandt, Thurloe-place, S.W.), Dr. H. Fielden Briggs and Dr. A. Livingstone will open a discussion on Modern Aspects of Dentistry. The meeting will be preceded by dinner at 7.30 P.M.

MEDICO-LEGAL SOCIETY.

THURSDAY, March 22nd.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Dr. Gerald Slot: Pain in its Medico-legal Aspects, followed by a discussion.

HUNTERIAN SOCIETY.

MONDAY, March 19th.—8.30 P.M.: Dinner at 7.30 P.M. (at Simpson's Restaurant, Bird-in-Hand-court, 77, Poultry, Cheapside). Discussion on Hiccup, to be opened by Dr. R. Hutchison and Sir Farquhar Buzzard.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

THURSDAY, March 22nd.—5 P.M., Dr. J. S. Collier: Epilepsy. (Lumleian Lecture (1).)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

FRIDAY, March 23rd.—5 P.M., Prof. Sir Arthur Keith: A Review of the Present State of Knowledge Regarding the Innervation and Movements of the Intestine.

ROYAL INSTITUTION, 21, Albemarle-street, W.

THURSDAY, March 22nd.—5.15 P.M., Group-Captain Martin Flack: Physiological Aspects of Flying.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.

WEDNESDAY, March 21st.—4 P.M. (at the Battersea Mortuary), Sir Bernard Spilsbury: Post-mortem Examination.

NATIONAL HOSPITAL, Queen-square, Bloomsbury.

MONDAY, March 19th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: The Narcolepsies.

TUESDAY, 2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Hinds Howell: Disorders of Sensation (2).

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Bailey: Treatment of Pain by Electrical Methods.

FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Sir Percy Sargent: Surgery of the Spinal Cord.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, March 19th, to SATURDAY, March 24th.—FELLOWSHIP OF MEDICINE LECTURE, Medical Society of London, 11, Chandos-street, Cavendish-square, W. Mon., 6 P.M., Prof. Frederick Langmead: Dull and Backward Children.—HOSPITAL FOR DISEASES OF THE THROAT, Golden-square, W. Thurs., 6.30 P.M., Special Clinical Demonstration by Mr. Theodore Just.—ROYAL FREE HOSPITAL, Gray's Inn-road. Thurs., 5 P.M., Special Lecture-demonstration by Prof. Louise McIlroy.—BROMPTON HOSPITAL, S.W. Intensive Course for one week.—HAMPSTEAD GENERAL HOSPITAL, Haverstock Hill, N.W. Practitioner's Course in Medicine, in Surgery, and in the Specialties. Mon. to Fri., 4.30 to 6 P.M.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. All-day Course—Clinics, Operations, Lectures.

Further particulars from the Secretary. Mayfair 2236.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.

THURSDAY, March 22nd.—4 P.M., Dr. B. Shires: X Ray Diagnosis; Diseases of the Chest.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith.

MONDAY, March 19th.—10 A.M., Dr. Dowling: Skin Department. 2 P.M., Dr. Trevor Davies: Gynæcological Department. 4.30 P.M., Mr. Addison (Special Lecture): Gastric Ulcer.

TUESDAY.—10 A.M., Medical Registrar: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose, and Ear Department. 4.30 P.M., Dr. Shaw (Special Lecture): Chest Pain.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Mr. Simmonds: Surgical Out-patients. 3 P.M., Sir Henry Simson: Gynæcological Ward.

FRIDAY.—10 A.M., Dr. Pritchard: Medical Wards. 12 noon, Dr. Ironside: Clinical Demonstration. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. Owen: Medical Diseases of Children.

Daily, 10 A.M. to 5 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments, Anæsthetic and Operative Surgery Classes.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.

MONDAY, March 19th.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

On Wednesday and Friday, at 2.30 P.M., there will also be demonstrations of Skin and Medical (Children) Cases by Dr. W. Jenkins Oliver and Dr. C. E. Sundell respectively.

On Monday and Friday there will also be demonstrations of Surgical and Medical Cases by Mr. Ralph Coyte and Dr. L. R. Yealland respectively.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 20th.—5 P.M., Dr. H. MacCormac: Malignant Growths of the Skin.

THURSDAY.—5 P.M., Dr. H. G. Adamson: Benign Growths of the Skin.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, March 23rd.—4 P.M., Mr. Watkyn-Thomas: The Indications for the Radical Mastoid Operation.

ST. PAUL'S HOSPITAL, Endell-street, W.C.

THURSDAY, March 22nd.—4.30 P.M., Sir Thomas Carey Evans: Stone in the Bladder, with Special Reference to Treatment by Lithotripsy.

PEOPLE'S LEAGUE OF HEALTH.

FRIDAY, March 23rd.—6 P.M. (at the Medical Society's Rooms, 11, Chandos-street, Cavendish-square, W.), Dr. Bassett Jones: Diet in Rheumatic Diseases.

ANCOATS HOSPITAL POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, March 22nd.—4.15 P.M., Mr. P. G. McEvedy: Visceroptosis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 20th.—4.15 P.M., Mr. C. Roberts: Treatment of Enlarged Prostate.

FRIDAY.—4.15 P.M., Dr. C. H. Melland: Demonstration of Medical Cases.

Appointments.

FOX, I. S., M.B., Ch.B. Liverp., to be Certifying Surgeon under the Factory and Workshop Acts for the Chester District.

Vacancies.

For further information refer to the advertisement columns.

Artificial Sunlight Clinic, 43, Leicester-square, W.C.—Hon. M.O.

Ashton-under-Lyne District Infirmary.—Third H.S. At rate of £150.

Aylesford, Kent, Hospital, &c., for Tuberculous Ex-Service Men.—Jun. P. £100.

Barbados Lunatic Asylum.—Asst. Med. Supt. £500.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Charing Cross Hospital.—Surg. Reg. £150. Also Asst. Surg.

City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.—P. to Out-patients.

Dublin, City Skin and Cancer Hospital.—Res. H.S., &c.

Dumfries, Crichton Royal Mental Hospital.—Clin. Pathologist. £400.

East London Hospital for Children and Dispensary for Women, Shadwell, E.—Asst. S.

Evelina Hospital, Southwark, S.E.—Med. Radiographer. £120. Also H.S. £120.

Hereford County and City Mental Hospital.—2nd A.M.O. £350

Hong-Kong.—Two Asst. M.O.H.'s Each £740.

Hospital for Sick Children, Great Ormond-street, W.C. 1.—H.S., H.P., and Asst. Cas. O. Each £50.

Huddersfield County Borough.—Asst. M.O.H. £500.

Indian Medical Service.—Commissions.

Ipswich, East Suffolk and Ipswich Hospital.—H.P. and H.S.'s, Each at rate of £100.

King Edward Memorial Hospital, Ealing, W.—Res. Asst. H.S. At rate of £100.

Liverpool Heart Hospital.—Hon. Asst. Phys.

Manchester, Victoria Memorial Jewish Hospital.—Sen. H.S. £250.

Middlesex Hospital Medical School, W.—Scholarship in Chemical Pathology. £150.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Hon. P. to Children's Spec. Dept.

Northampton General Hospital.—Asst. H.S. At rate of £150.

Norwich, Norfolk and Norwich Hospital.—Hon. Surg. for Ear, Nose and Throat Dept.

Nottingham General Dispensary.—Res. Lady Surg. £250.

Plymouth, South Devon and East Cornwall Hospital.—H.S., H.P., and Cas. H.S. All at rate of £50.

Prince of Wales's General Hospital, Tottenham, N.—H.S.'s and H.P., also Jun. H.S. and Jun. H.P. At rate of £120 and £90 respectively.

Queen's Hospital for Children, Hackney-road, E.—P. in charge of Skin Dept.

Rochdale Infirmary and Dispensary.—Jun. H.S. £200.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £150, Also Res. Anæsthetist.

Shanghai Municipal Council.—Second Asst. Commissioner of Public Health. Taels 600 per mensem.

South London Hospital for Women, Clapham Common, S.W.—H.P. and H.S.'s. Each at rate of £50.

Sutton, Surrey, Downs Hospital for Children.—Jun. Asst. M.O. £500.

West London Hospital, Hammersmith, W.—Hon. Med. Reg. £100. Also Hon. Anæsthetist.

Willesden General Hospital, Harlesden-road, N.W.—Res. H.S. At rate of £100.

Births, Marriages, and Deaths.

BIRTHS.

GLINDON.—On March 5th, at Stoneleigh, Wimbledon, the wife of Reginald A. Glindon, L.D.S. R.C.S. Eng., of a daughter.

HIGGINS.—On March 6th, at "Ringrone," Woking, Surrey, the wife of Dr. L. G. Higgins, of a son.

MARRIAGES.

GREY—WILLIAMS.—On Feb. 29th, at St. Mark's, Little Common, Bexhill, John C. P. Grey, M.A., M.B., to Ella Idonia, second daughter of the late Mr. G. E. Williams, of Buxa Duars, Bengal, India, and of Mrs. G. E. Williams, of Cooden, Bexhill.

DEATHS.

BROWNE.—On March 7th, Henry William Langley Browne, O.B.E., LL.D., M.D., F.R.C.S.E., J.P., at 196, Hagley-road, Edgbaston, aged 79.

FERGUSON.—On March 5th, at a nursing home, Edinburgh, William Haig Ferguson, M.C., M.A. Camb., M.B., Captain, R.A.M.C., aged 37.

PASSMORE.—On March 7th, suddenly, of heart failure following pneumonia, J. Ernest Passmore, M.R.C.S., L.R.C.P., of Doddington, March, Cambs, aged 61.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

FATAL STREET ACCIDENTS IN LONDON.—Scotland Yard has just published, for the first time, details of the causes of fatal street accidents in London. The return, which covers the last quarter of 1927, shows that most of the accidents happened to adults, and that children taught "safety first" in schools are so careful in crossing the streets that they avoid accidents. In the three months 312 persons were killed, only 55 of whom were under 15 years of age.

Notes, Comments, and Abstracts.

PARALYSIS CURED BY MALARIA.

THE FIRST KNOWN CASE—1850.

By E. W. Gudger,

BIBLIOGRAPHER AND ASSOCIATE IN ICHTHYOLOGY, AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK CITY.

During the past eight or ten years much interest has been aroused in the malarial treatment of paralysis, and the medical literature abounds in reports of cases where paralytics have been subjected to bites by mosquitoes bearing malarial germs or have been directly infected hypodermically with *Plasmodium malariæ*. The malarial attacks relieve the paralysis and the germs are then destroyed by the use of quinine. Of late rat-bite fever has also been found efficacious, its germs being killed by arsphenamine when their work is done.

I am not a medical man, and have no first-hand knowledge of these matters. Some months ago, however, while checking up the medical bibliographies in search of articles on fishes therein contained, I chanced upon an account of such a phenomenon which was reported 76 years ago. Since this is of great historical interest to medical men, I am reproducing the report herein in the exact form in which it was originally published in the *New Orleans Medical and Surgical Journal* (1850, vii., 41). It is entitled "A Case of Hemiplegia (Cured by an Attack of Fever)," by A. Morris, M.D., of Lowndes County, Ala.

"February, 1848—Enoch Singleton, (64)—Attacked with hemiplegia: the only treatment for the first few days, as far as I could ascertain, was mild laxatives and strychnine. I saw him for the first time ten days after the attack: entire loss of motion on one side of the face; but very little use of either extremity of same side; considerable pain in the occipital, extending front, below the ear of side affected: cups to the nape of the neck; blister to the same region, continue use of the strychnine. Treatment continued for a few days. No improvement. Ordered all medicines stopped, and use cold bath once a day. Improved slowly; able to get about tolerably; face worse; sensation and motion both gone. Continued about the same until August 5th; had a chill; took a small dose of calomel on the 7th; drank very freely of pepper tea, in hopes to keep both disease and chill off. I was called in on evening of same day; found him with much fever, and pulse quick, soft, and intermitting; skin hot and dry; tenderness over the abdomen generally; pain in head; delirium.

℞ Sub. Hyd. x. gr.;
Pulv. Dov. gr. xv. M. No. vi.;

one every two hours until fever subsides, or all are taken; mustard poultice to abdomen; left twenty grains quinine in five powders, to be taken one every four hours; to commence as soon as skin becomes moist.

"Morning of the 8th, 10 o'clock.—No fever; pulse seventy—full and soft; skin moist; hiccough; complains of pain in head; bowels have moved twice; taken all the quinine.

℞ Sulph. Morph. 1–4 gr. immediately.
℞ Gum Assafœtida.
Quinine āā. x. gr. M.

in pill No. vi, one every three hours.

℞ Sulph. Morph. 1 gr. et divid.

in four powders—one every four hours till hiccough ceases.

"9th.—Much worse; hiccough constant; great prostration; pulse soft; no pain; blister two by eight over diaphragm; one, two by six to spine; cups; internally camphor, must and assafœtida.

"10th.—Prostration complete; no pulse at wrist; breathing laborious; hiccough constant; blister drew well; brandy and quinine freely—can't say what amount; camphor poultice to abdomen; spent the day with him; no change until six in the evening; pulse to be felt occasionally; at midnight distinct; skin moist; hiccough continues; 1–4 gr. morphine repeated every half hour.

"Morning of 11th.—Hiccough less frequent; health better; slept about an hour for the first time; quinine and assafœtida 2 1–2 grains each every three hours; blue pill and aloes āā v. grs.

"12th.—Much better; pulse tolerably full; hiccough continues, but at intervals; recognises me, but unable to articulate; bowels moved twice; gums sore; has been frequently ptyalised before; continue quinine and assafœtida; took a little gruel.

"13th.—Has slept considerably; hiccough continues, but at intervals of an hour or more. From this time took nothing but quinine and assafœtida; improved regularly on, until finally discharged on the 19th, well both of the present attack and the paraplegia—not a vestige remaining; face straight, and in fact all correct; in better health from this time until Nov. 18th, 1849, than for years previous. At the above date he called on me to show a sore arm of some few days' standing; upon examination I found he had phlebitis of the left arm; it was much swollen; painful, stiff, and red, in the course of the vein from the shoulder to near the hand; the vein felt like a cord, and full of knots—size of filberts; complains of cold chills running over him constantly for the last twelve hours; constitutional symptoms very trifling, but slight acceleration of pulse; no fever.

℞ 24 grs. calom., vi. grs. opii. M.
Divide in pulv. No. xii.;

one three times a day; keep quiet; use poultices; whiskey and water, or water, as may feel best to arm. Saw him a few days after; three of the knots had gone on to ulceration; opened spontaneously; looked very much like common boils. He is now well."

NATIONAL BABY WEEK COUNCIL.

The annual general meeting of the Council was held at Carnegie House on March 7th, Mr. E. B. Turner presiding. The Astor Challenge Shield for the great towns (won by Northampton), the William Hardy Challenge Shield for smaller areas (won by Cambridgeshire villages), and other awards for the most successful baby week campaign were presented. After adoption of the report and appointment of honorary officers an address on the Prevention of Maternal Mortality was given by Prof. Louise McIlroy. She referred to two measures which would help in bringing down the maternal death-rate—viz., to extend throughout the country the standard of efficiency in obstetrics now maintained in the voluntary hospitals, and to ensure that every pregnant woman should be examined at least once during the antenatal period. The health of the woman after confinement was as important as the prevention of deaths due to childbirth. Vesico-vaginal fistula, which used to be common, was now so rare that she had not seen a case in the last seven years of constant maternity work. Diminution in prolapse and other disabling postnatal conditions was further evidence of the better conduct of labour. Cases in which pregnancy was complicated by heart disease were now discovered early, owing to antenatal care, and there had been no death during labour or the puerperium among 150 cases with heart complications treated at the Royal Free Hospital. The three essentials in combating a high maternal mortality-rate were, said Prof. McIlroy, these: (1) modern maternity institutions, with special accommodation for antenatal care; (2) proper housing conditions when confinements were to be conducted in the home, with skilled attention from doctor and nurse, and transport facilities when necessary; (3) examination by a doctor of every mother at least once during pregnancy, and once after convalescence in cases where the confinement had been attended by a midwife.

LEAD POISONING FROM SNUFF.

Certain sources of lead poisoning by food are well recognised; lead-containing jam-jars and packings, and the lead-foil used for wrapping tobacco and chocolate, have all been incriminated at various times. Though very few reports have been made of lead being carried by snuff, the structure of the upper respiratory tract is favourable to its absorption. Thus Stadler [1] has described the death of a woman through the habitual use of snuff wrapped in a metal foil containing 89 per cent. lead; the snuff was apt to be moist, and the sample examined contained 1·75 per cent. of the metal. A still more direct hazard is reported by Dr. Joseph Uttal in an account of three recent cases in New York.[2] The patients were all Jews from Eastern Europe, among whom snuff-taking is common, and were all suffering from chronic lead poisoning caused by the same brand of snuff, a cheap product which was adulterated with lead chromate and lead oxide to improve its colour. The lead content of the mixture was actually 3·4 per cent. The commodity was promptly put under embargo, but the Food and Drugs Act in the States does not include snuff in its scope, and it is said that no effort is made to prevent its adulteration.

THE CANCER CAMPAIGN IN MANCHESTER.

The Manchester Committee on Cancer was founded in 1924 to establish a single and properly co-ordinated effort for cancer research and investigation. A public appeal for £20,000 was launched in 1925 and about £12,500 was received. A report of the work carried out during the last 12 months has just been published.[3] The University has afforded facility for close coöperation with its laboratory workers and research there has been directed towards the cause of mule-spinner's cancer. In addition, grants have been made to Dr. K. V. Bailey for work on cancer of the cervix, and to Dr. J. B. Duguid for investigations into the incidence of intrathoracic tumours.[4] Two special investigation officers, Dr. Gretta Wardle and Dr. John Murray, were appointed to organise regular and complete records and regular observation of cases of cancer in the city, and the

[1] Schweiz. Med. Woch., 1912, i., 202.
[2] Jour. Amer. Med. Assoc., 1928, xc., 288.
[3] Report of the Manchester Committee on Cancer for the years 1925, 1926, and 1927. Manchester: Henry Blacklock and Co., Ltd.
[4] The Lancet, 1927, ii., 111.

collection of histological material from hospitals, and to work on the lines of the Minister of Health's inquiry into cancer of the breast. The Committee also undertakes public education on the subject of cancer. In the winter of 1926–27 a course of 12 post-graduate lectures was arranged for medical men, and leaflets have been issued to the public. More funds are urgently needed and the Lancashire, Cheshire, and North Wales Council of the British Empire Cancer Campaign is launching an appeal this month. This Council was formed in November last by a combination of existent Cheshire, Liverpool, and Manchester Committees, and on March 6th Prince Henry, as its President, addressed meetings at Liverpool and Manchester to arouse public interest. Of the total funds subscribed, 5 per cent. will go to the national campaign, whilst the remainder will be used locally for research and treatment.

WHO'S WHO IN THE NURSING WORLD.

Mr. H. E. Smithers, late general manager of the Scientific Press, Ltd., has just brought out a useful little year-book of the nursing profession. In his preface he remarks that it was not until the exigencies of the Great War that nurses invaded the columns of well-known books of reference, and even now there is no publication supplying authoritative details of women who have made a mark or hold high rank in the nursing world. That is the occasion for the issue of the present volume, and although the personal details contained in it are unequal, that is not altogether the fault of the compiler, who expressly asks for help from outside in any later issue. Before coming to the list of names the reader will find more than a hundred pages of tabular matter relating to nursing services, institutions, societies, clubs, journals, and training schools, giving the latest information and arranged conveniently for reference. The general reader will welcome the reproduction of the various medals and badges which nurses and midwives are now entitled to wear and which should distinguish them clearly in the public eye from others masquerading as such. The year-book is published by the H. Edgar Smithers Publishing Company, 139, High Holborn, London, W.C. 1, at the price of 5s. It is proposed to issue it yearly in the first week of January.

A SCOTSMAN AT THE RUSSIAN COURT

A NOTE on Sir James Wylie, who gained respect for British medicine a hundred years ago in Russia, was read by Dr. Robert Hutchison, his distant relative, at the Royal Society of Medicine on March 7th. Born at Kincardine in 1758, Wylie studied at Edinburgh and Aberdeen, and went to Russia soon after graduating in 1794. At this time there was almost no organised medical profession in Russia, and for the service of the Court and the nobility, medical talent was mainly drawn from abroad, often from Scotland. Wylie remained for a time undistinguished in the country of his adoption, but eventually made his name by treating one of the Czar's favourites. This person had developed an abscess in the front of the neck, and Wylie—alone of those called in consultation—had the courage to open it. The patient was immediately relieved, and the Czar Paul was so pleased that he at once made the Scotsman a Court physician. Later, when Paul was assassinated, the physician was tactful enough to say that if he had escaped violence he would soon have died of apoplexy, and thus he became a great favourite of the successor, Czar Alexander. Wylie did much work in military surgery in the many wars of the period, at Borodino and elsewhere. He took a leading part in founding the Medico-Chirurgical Academy of St. Petersburg, and in 1818 was made Director of the Army Medical Department. It was then thought a great credit to Britain that one of her sons should have organised civil and military schools of medicine in Russia, and secured for the soldier a care and attention to which he had formerly been a stranger. Wylie was very eccentric and extremely frugal; he was unmarried, and left the whole of his wealth to the Czar, who therewith founded the large military hospital, "The Michael Clinical Hospital of Baronet Wylie" at St. Petersburg. He came to England with the Czar, and was knighted by the Prince Regent, later being made a baronet.

FEES FOR THE EXAMINATION OF CASUALS.

"VAGRANT" writes: I should be glad if any of your readers who are poor-law medical officers would inform me of the arrangements they have made with their respective guardians as to fees for the examination of casuals up to March 31st. The Minister of Health states that "a reasonable fee will be paid," but he does not state the amount. Under the Vagrancy Act these casuals are entitled to leave a workhouse at 9 A.M., and the examination of them at that hour causes considerable dislocation of a morning's programme. I understand that some men are getting 1s. per casual, while others are being paid 5s. per day. My guardians have asked that the matter be left till March 31st, and it appears to me that I also may be left.

A SPANISH REVIEW OF MEDICAL LITERATURE.

As this volume [1] is apparently the first definite attempt made to enable the medical profession in Spain to avail themselves of foreign work, it certainly deserves a welcome. Printed on the cover is a statement that it is intended to make its contents representative of "the whole medical efforts of the world." There are about 180 separate articles derived from some 40 publications, nearly half of which are German, and seven of these furnish over 80 items. Of the rest 50 are French, a dozen English, four Swiss, and two Scandinavian. The United States, Italy, and the rest of the world are not represented at all. It is clear, therefore, that the editors will have to enlarge the scope of succeeding numbers considerably if their claim to represent the world's medical output is to be substantiated, and no doubt this will be done as the work expands. It will also need considerable modification if it is to be a convenient work of reference for the practitioner. At present there is no means of finding a particular item without going through the whole volume. There is no index and nothing to show that the subjects are grouped, as the groups are not divided or shown by headings. Elaborate arrangements are made by means of a key page at the end to help the reader to index his extracts when found, but nothing to help him to find them. The method of printing on paper boards up and down the page makes the book difficult to handle for quick reference, and but few, we fear, will be found to cut up the whole and card index it which seems to be the idea in adopting this form. The extracts given range pretty well over the whole field of medicine and seem to be adequately translated; it is much to be hoped that by expansion and alteration the editors may bring this publication up to the level which they announce on the cover.

TREATMENT OF PNEUMONIA BY GLUCOSE.

IN a recent paper [2] Dr. Ralph Lynch and Dr. Bruce Webster, of Montreal General Hospital, describe some results of treating pneumonia with intravenous glucose. It has been shown, they say, that this is the one remedy which will combat myocarditis produced experimentally in dogs by injecting increasing doses of diphtheria toxic. Taken in conjunction with the fact that metabolism in pneumonia is increased from 20 to 50 per cent. above normal this seemed to justify trial of the treatment in human beings. As soon, therefore, as the diagnosis was established the patients were given an intravenous injection of 250 c.cm. of 20 per cent. glucose saline solution and administration of the sugar was continued once daily—or twice in very serious cases—until 24 hours after the crisis. At the same time glucose solution flavoured with lime, lemon, or orange, and meat broths, with a total caloric value of 3600 per diem, were given by the mouth. No very definite conclusions were reached for only 11 cases were treated, but it was thought that the treatment may have been instrumental in saving the life of two of the patients.

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[1] Bibliographia Medica Chirurgica, No. 1, bimonthly. Director: Dr. Leon Cardenal y Pujals. Madrid. 1927. Pp. 96. 70 pesetas yearly. [2] Jour. Canad. Med. Assoc., 1928, xvii., 52.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 61 cases were considered and £1057 voted to 51 applicants. Since the beginning of the year £2203 has been made in grants to urgent cases of distress. The demands for help increase and subscriptions are very urgently needed; they should be sent to hon. treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, W.1. The following are notes on a few of the cases relieved at the last meeting:—

Widow, aged 39, of M.B. Aberd. who died in December, 1927. The husband was just getting out of financial difficulties, having recently started a new practice, when he fell ill and died of cancer after a year and a half of illness. The practice was sold for £500, all of which went to pay his debts and the expenses of the illness. The widow has been left with a boy, aged 14, and a capital of only £45. Voted £24 and case handed to the Guild, who will try to find work for the widow.

Widow, aged 54, of M.D. Camb. The husband was an annuitant of this Fund. At his death the pension from Epsom and from the Freemasons ceased, and his widow has been left absolutely destitute and homeless. She has found work in return for board and lodging, which will give her time to look for a salaried post. Voted £26.

Daughter, aged 58, of M.R.C.S. Eng. Has supported herself and her delicate sister by literary work since the death of her father. In 1926 she fell ill from overwork and her living went. Gradually she has sold all she had, and now she and her sister are living in lodgings for which they pay £1 a week. This covers the rent of the room and the food for the two. It is all they can afford. Voted £26.

Daughter, aged 65, of L.R.C.P. Edin. Was working as a governess in Russia at the time of the Revolution; was forced to leave and lost all her savings. She has returned to this country at an age when it is impossible to continue her work. Her income in all is only £60 a year. Voted a further £26.